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Does Heat Emanate Beyond the Threshold - Home Infrared Emissions, Remote Sensing, and the Fourth Amendment Threshold

Susan Moore

DOES HEAT EMANATE BEYOND THE THRESHOLD?: HOME INFRARED EMISSIONS, REMOTE SENSING, AND THE FOURTH AMENDMENT THRESHOLD*

SUSAN MOORE**

INTRODUCTION

The Fourth Amendment to the Constitution guarantees the fundamental right of Americans to be secure against unreasonable searches and seizures by their government.[1] It provides our principal constitutional protection against unjustified government intrusions into individual privacy and property interests.[2]

Does this constitutional right protect individuals from unwarranted use of advanced remote sensing technology[3] to gather information about activity within American homes? The Supreme Court has not directly addressed this question. However, it has held that the Fourth Amendment does not protect the people from sophisticated government investigatory tactics, however unreasonable, which circumvent the Court's complex Fourth Amendment threshold test.[4]

* This note was inspired by, and is now dedicated to, my dear father, who loved freedom and reason. Rest in peace.

** Senior law student at Chicago-Kent College of Law.

1. The Fourth Amendment provides:

> The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated, and no Warrants shall issue, but upon probable cause, supported by Oath or affirmation, and particularly describing the place to be searched, and the persons or things to be seized.

U.S. CONST. amend. IV.

2. *See* Anthony G. Amsterdam, *Perspectives on the Fourth Amendment*, 58 MINN. L. REV. 349, 377-79 (1974). Notwithstanding the other safeguards provided within the Constitution, "the limits of American society's effective control over the largest part of the spectrum of police powers and potential abuses depend upon the scope given to the fourth amendment." *Id.* at 377. Although legislatures are constitutionally empowered to provide protection against government intrusions, legislators generally consider it political suicide to act to control law enforcement activities. *Id.* at 378-79.

3. Remote sensing is a branch of technology that uses sensors and computers to analyze objects of investigation from a remote location. *See infra* part I.

4. *See generally* Melvin Gutterman, *A Formulation of the Value and Means Models of the Fourth Amendment in the Age of Technologically Enhanced Surveillance*, 39 SYRACUSE L. REV. 647 (1988). "Presently, the Court measures the existence of fourth amendment privacy solely by reference to . . . [a] 'means model'" rather than a "privacy model." *Id.* at 650. "This approach fails to protect privacy rights, and permits their gradual decay with each improved technological advance." *Id.*

The threshold question in Fourth Amendment analysis is whether the conduct of government agents constitutes either a "search" or a "seizure."[5] This question correctly recognizes that our government performs a host of legitimate functions that bring its agents into contact with the people in ways that cannot be described as searches or seizures.[6] Where the Court finds that particular government action involved a Fourth Amendment search or seizure, it continues its Fourth Amendment analysis to determine whether the government's intrusion was reasonable.[7] If no search or seizure is found, the Fourth Amendment inquiry ends and its protections will not apply.[8]

How the Court delineates the Fourth Amendment threshold has a profound impact on American liberty. The threshold analysis determines which types of government intrusions require some justification. Thus, it is our nation's principal restraint on unbridled, arbitrary police action.[9]

Although most Fourth Amendment questions come before the Court within the context of criminal cases,[10] the Court's threshold de-

5. WAYNE R. LAFAVE, SEARCH AND SEIZURE: A TREATISE ON THE FOURTH AMENDMENT § 2.1 (2d ed. 1987).

6. *See, e.g.*, Katz v. United States, 389 U.S. 347, 351 n.5 (1967) ("Virtually every governmental action interferes with personal privacy to some degree. The question in each case is whether that interference violates a command of the United States Constitution.").

7. The Fourth Amendment does not prohibit the government from performing "reasonable" searches and seizures. For comprehensive discussions of the tests for "reasonableness," see LAFAVE, *supra* note 5, and Amsterdam, *supra* note 2. With some exceptions, searches and seizures are presumptively unreasonable unless they are based on probable cause and performed with a warrant issued by a neutral and detached magistrate. Unlike a police officer, a magistrate is not "engaged in the often competitive enterprise of ferreting out crime." Johnson v. United States, 333 U.S. 10, 14 (1948).

Exceptions include searches performed with consent and where exigent circumstances require immediate action. 1 JOHN WESLEY HALL, JR., SEARCH AND SEIZURE §§ 8:1, 14:1 (2d ed. 1991).

Probable cause has not been clearly defined. However, it requires at least a fair probability that evidence of crime is located in the place to be searched. *Id.* § 3:7.

8. Amsterdam, *supra* note 2, at 388. "It is only 'searches' and 'seizures' that the fourth amendment requires to be reasonable: police activities of any other sort may be as unreasonable as the police please to make them." *Id.*

9. "The basic purpose of this Amendment, as recognized in countless decisions of this Court, is to safeguard the privacy and security of individuals against arbitrary invasions by governmental officials." Camara v. Municipal Court, 387 U.S. 523, 528 (1967).

See generally Amsterdam, *supra* note 2. Amsterdam's article provides a comprehensive analysis of how, absent judicial review, police activity is necessarily arbitrary and discriminatory. When the Court struggles with the understandably difficult task of Fourth Amendment analysis, the "Court [is] in the throes of one of its noblest labors. That labor is to be the instrument by which a free society imposes on itself the seldom welcome, sometimes dangerous, always indispensable restraints that keep it free." *Id.* at 353.

10. Most Fourth Amendment decisions are made in judgment on a criminal defendant's motion to exclude evidence that was acquired in violation of Fourth Amendment protections. Although Fourth Amendment rights may be legally enforceable in civil and criminal actions

cisions affect all of us—criminal suspects and non-suspects alike.[11] Where the Court is unwilling to characterize particular government investigatory tactics as either a search or seizure under the Fourth Amendment, the Court is effectively holding that such tactics do not require reasonable justification, regardless of whether the subject of investigation is a criminal or a law abiding citizen.[12] Consequently, all Americans become widely exposed to such investigatory methods that may be exercised without a warrant, at the discretion of government agents, and free from judicial review.

The Court first considered the Fourth Amendment threshold question in 1886.[13] During the 100 years that followed, the Court had to determine the reach of Fourth Amendment protections within the context of increasingly sophisticated methods of investigation, coupled with waves of public concern over crime and political subversion.[14] This challenge particularly burgeoned over the last two

against government officers who violate them, such actions are rarely maintained, or as a practical matter, maintainable. Amsterdam, *supra* note 2, at 360.

11. *See, e.g.*, Arnold H. Loewy, *The Fourth Amendment as a Device for Protecting the Innocent*, 81 MICH. L. REV. 1229 (1983). "The Fourth Amendment is designed to protect innocent people . . . ." *Id.* at 1272; *see also* OFFICE OF TECHNOLOGY ASSESSMENT, U.S. CONGRESS, CRIMINAL JUSTICE, NEW TECHNOLOGIES, AND THE CONSTITUTION (1988) [hereinafter NEW TECHNOLOGIES].

> In the past, concern about surveillance and privacy has generally focused on the constitutional rights of individuals who are suspected of criminal activity. But many people are now concerned that the increasing use of monitoring techniques may impinge on the privacy of the general public, and indicates a subtle widening of the net of social control that goes far beyond traditional democratic practices.

Id. at 4.

12. Anthony Amsterdam stated:

> [U]nless the fourth amendment controls tom-peeping and subjects it to a requirement of antecedent cause to believe that what is inside any particular window is indeed criminal, police may look through windows and observe a thousand innocent acts for every guilty act they spy out. . . . The question is not whether you or I must draw the blinds before we commit a crime. It is whether you and I must discipline ourselves to draw the blinds every time we enter a room, under pain of surveillance if we do not.

Amsterdam, *supra* note 2, at 403.

13. *See infra* text accompanying notes 46-54.

14. *See, e.g.*, WILLIAM O. DOUGLAS, THE RIGHT OF THE PEOPLE (1958). In this book, Justice Douglas reaffirmed the need for vigilant protection of constitutional liberties during the post-World War II era, when the nation was overwhelmed by its fear of communism and the growth of the military imperiled civilian authority. With regard to the Fourth Amendment, Douglas was particularly concerned about the use of wire-tapping:

> The legal controversies over the application of . . . [the Fourth] Amendment have been numerous. Every Fourth Amendment contest involves to a degree an issue of privacy. The right to be secure in one's own castle, the right to be free of snoopers, the right to keep the officers of the law out of one's bedroom and out of one's files are the values at stake in many of these contests. None has been more dramatic than the contests over wire-tapping.
>
> . . . . [T]he controversy . . . has been whether wire-tapping is a search within the meaning of the Amendment. If so, it requires a showing of probable cause to a magistrate that a crime has been or is being committed before a wire can be tapped. If not, it goes unregulated except as Congress or the States legislate concerning it.

decades as the government accelerated its development and use of technological innovations in the investigation of crime.[15]

The modern Court's threshold analysis regarding searches is alarming.[16] The modern Court has legitimized, by making unreviewable, the government's use of many sophisticated surveillance techniques, which are used to gather information about the private lives of the people. It has done so by defining a "search" in terms that cannot be reconciled with Fourth Amendment precedent, nor with common understandings of the word "search."[17] Instead, the current measure of a Fourth Amendment search is derived through a complex judicial assessment of individual and societal expectations regarding the risks of modern living. This assessment has pushed many modern investi-

Id. at 149; *see also* SENATOR EDWARD V. LONG, THE INTRUDERS: THE INVASION OF PRIVACY BY GOVERNMENT & INDUSTRY (Frederick A. Praeger 1967) (1966). Writing about progressive challenges to Fourth Amendment rights, Senator Long observed, "During our nation's first century, searches and seizures were physical in nature and therefore clearly visible to the naked judicial eye. But wiretapping and other technological advances have introduced subtle, complicated elements." *Id.* at 128.

Senator Long was alarmed about the proliferation of electronic surveillance of citizens in our society. He wrote:

> Excessive pressures are already here in abundance and, unless they are recognized and stopped, we may slip past the point of no return. Over twenty-five years of hot and cold wars have dulled our sensitivities to individual freedom. So-called security has become an overriding concern to many Americans. It does not occur to many Americans that the men who drafted the Bill of Rights were quite familiar with espionage, sabotage, subversion, murder, mayhem, larceny, and robbery. Yet they chose the freedom guaranteed by the Fourth Amendment and the other provisions of our Constitution. These men could have had security as a colony of Britain, but they chose freedom. In the words of Jefferson, "Timid men . . . prefer the calm of despotism to the boisterous seas of liberty."

Id. at 61.

15. *See* NEW TECHNOLOGIES, *supra* note 11.

> As recently as the 1960s, criminal justice institutions lagged far behind business and Federal Government agencies in adopting new technology. Then, in 1967, the President's Commission on Law Enforcement and Administration of Justice made sweeping recommendations for modernizing the administration of criminal justice with new technologies. The technological innovations that followed in the next two decades have transformed nearly every component of the criminal justice system.

Id. at 1 (referring to THE PRESIDENT'S COMM'N ON LAW ENFORCEMENT & ADMIN. OF JUSTICE, THE CHALLENGE OF CRIME IN A FREE SOCIETY 244-71 (1967)).

16. Searches involve intrusions into privacy interests, while seizures involve interferences with possessory interests. 2 JOHN WESLEY HALL, JR., SEARCH AND SEIZURE § 19:8 (2d ed. 1993). This Note considers the threshold test for searches only. The threshold test for seizures is beyond its scope.

17. Common definitions of "search" include: "to look at or examine . . . carefully in order to find something concealed"; "to look at, read, or examine . . . for information"; "to inquire, investigate, examine, or seek." THE RANDOM HOUSE DICTIONARY OF THE ENGLISH LANGUAGE, Unabridged (2d ed. 1987).

For an in depth analysis on this subject, see Clark D. Cunningham, *A Linguistic Analysis of the Meanings of "Search" in the Fourth Amendment: A Search for Common Sense*, 73 IOWA L. REV. 541 (1988).

gatory methods virtually beyond the reach of the Fourth Amendment's reasonableness requirement.

The Court may soon consider whether government use of a particular class of remote sensing technology, thermal infrared imaging systems, may constitute a Fourth Amendment search subject to warrant requirements and judicial review. Since 1991, several federal district courts have held that the Fourth Amendment was not implicated when government agents, acting without a warrant, inspected individuals' homes by using Forward Looking Infrared (FLIR) systems, or equivalent devices, to read and analyze the characteristics of invisible thermal infrared emissions.[18] The Fifth, Seventh, Eighth, and Eleventh Circuit Courts have agreed with this line of cases.[19]

However, not all courts agree. In February 1994, a district court became the first federal court to conclude that the Fourth Amendment prohibited a warrantless FLIR inspection of a private building.[20] That same month, the Supreme Court of Washington held that both its state constitution and the Fourth Amendment protect individuals against warrantless home infrared inspections.[21]

The FLIR-related Fourth Amendment jurisprudence requires serious and careful regard. The FLIR is one member of a broad class of technology that enables sweeping clandestine surveillance from remote locations. How the courts resolve the threshold question with regard to the FLIR necessarily lays a foundation for deciding Fourth Amendment challenges to an entire breed of high-tech surveillance practices of Orwellian dimensions. Thus, the underlying question lurking within the FLIR cases is where, if anywhere, the judiciary will draw the line on advanced remote surveillance of the American citizenry.

18. United States v. Domitrovich, No. CR-93-295-FVS, 1994 U.S. Dist. LEXIS 6928 (E.D. Wash. Mar. 24, 1994); United States v. Porco, 842 F. Supp. 1393 (D. Wyo. 1994); United States v. Kyllo, 809 F. Supp. 787 (D. Or. 1992), *remanded for evidentiary hr'g*, 37 F.3d 526 (9th Cir. 1994); United Sates v. Deaner, No. CR-92-0090-01, 1992 U.S. Dist. LEXIS 13046 (M.D. Pa. July 27, 1992), *aff'd on other grounds*, 1 F.3d 192 (3d Cir. 1993); United States v. Penny-Feeney, 773 F. Supp. 220 (D. Haw. 1991), *aff'd on other grounds*, 984 F.2d 1053 (9th Cir. 1993).

19. United States v. Ishmael, No. 94-40159, 1995 U.S. App. LEXIS 4957 (5th Cir. Mar. 15, 1995); United States v. Myers, 46 F.3d 668 (7th Cir. 1995); United States v. Pinson, 24 F.3d 1056 (8th Cir. 1994), *cert. denied*, 115 S.Ct. 664 (1994); United States v. Ford, 34 F.3d 992 (11th Cir. 1994).

20. United States v. Ishmael, 843 F. Supp. 205 (E.D. Tex. 1994) (order granting defendants' motion to suppress), *rev'd*, No. 94-40159, 1995 U.S. App. LEXIS 4957 (5th Cir. Mar. 15, 1995); *see also*, United States v. Field, No. 94-CR-0013-C, 1994 U.S. Dist. LEXIS 8829 (W.D Wis. June 9, 1994) (holding that thermal imaging of a residence constitutes a Fourth Amendment search.)

21. Washington v. Young, 867 P.2d 593 (Wash. 1994). The Washington constitution protects an individual's home and "private affairs" from warrantless searches. *Id.* at 597 (referring to WASH. CONST. art. 1, § 7).

This Note argues that the Fourth Amendment applies to government use of remote thermal infrared devices in particular and remote sensing devices in general. Part I discusses remote sensing technology and the government's use of thermal imaging devices. Part II reviews the origin and evolution of the Fourth Amendment threshold analysis, and its modern application. Part III criticizes the modern threshold test for its overall failure to offer protection to free citizens in a technologically advanced nation. The Court is urged to reorient its threshold analysis so that judicial review will be available as a check on intrusive remote sensing surveillance. Part IV discusses and analyzes five thermal imaging cases from four federal districts and one state supreme court.[22] These cases embody the gamut of facts and legal analysis that are shaping this area of Fourth Amendment jurisprudence.

I. REMOTE SENSING AND FORWARD LOOKING INFRARED (FLIR) SYSTEMS

A. *What are Remote Sensing Systems?*

Remote sensing is a branch of technology that combines physics and electronics to derive information that may be otherwise inaccessible.[23] Remote sensing systems use special sensors to gather data about their objects of investigation, without making physical contact with the objects. Computers analyze this data and convert it into meaningful information.

Most remote sensing systems detect and analyze electromagnetic radiation (EMR).[24] All natural and synthetic substances both emit and reflect EMR in their own characteristic manner according to their chemical composition and physical state. Through remote sensing systems, these distinctive features and conditions become recognizable "signatures" that make it possible to identify individual objects.[25]

22. *Ishmael*, 843 F. Supp. 205; *Kyllo*, 809 F. Supp. 787; *Deaner*, 1992 U.S. Dist. LEXIS 13046; *Penny-Feeney*, 773 F. Supp. 220; *Young*, 867 P.2d 593.

23. *See generally* THOMAS E. AVERY & GRAYDON L. BERLIN, FUNDAMENTALS OF REMOTE SENSING AND AIRPHOTO INTERPRETATION (5th ed. 1992).

24. *Id.* at 1. EMR is "electromagnetic energy in transit that can only be detected when it interacts with matter." *Id.* at 3. Electromagnetic energy is "associated with atomic nuclei during fission and fusion reactions, with electrons as they drop from high-[energy] to lower-energy orbits in an atom or molecule, and with the random movement of atoms and molecules." *Id.* at 1.

25. *See id.* at 14-15. Perhaps the most familiar, natural EMR remote sensing system involves the human eye and brain, which work together to detect the unique characteristics of an object's EMR, in the form of visual light, and interpret this "data" into meaningful information about the object. *See id.* at 1, 5-6.

Through imaging systems, computers translate these signatures into "user-friendly" visual images.

Visible light makes up a tiny fraction of the full spectrum of EMR. EMR also includes invisible "spectral regions" such as gamma, X-ray, ultraviolet, infrared, microwave, and radio energy. The full EMR spectrum is several million times broader than the region perceptible through visible light.[26]

Remote sensing systems have been developed that can detect and interpret data throughout the EMR spectrum. Multispectral systems integrate the data derived from multiple spectral regions, allowing more complex and meaningful analyses. Through multitemporal remote sensing, additional data is gathered over time and makes it possible to monitor changes in objects of investigation.[27] Most of these remote sensing systems operate from robotic earth observation satellites.[28] Satellite imaging technology has been described as "one of the most powerful tools in America's espionage arsenal."[29]

B. FLIR Systems

FLIR systems are real-time thermal infrared scanning and imaging systems that were developed as night surveillance tools for the military.[30] Since all objects with temperatures above absolute zero[31] continually emit distinctive thermal infrared radiation, these thermal imaging systems can detect and identify an object of investigation

26. *Id.* at 5.

27. *Id.* at 17-18 (discussing the "multi" concept in remote sensing).

28. For a thorough description of electromagnetic radiation and practical applications of remote sensing systems, see generally AVERY & BERLIN, *supra* note 23. Remote sensing systems are extensively employed by the United States and foreign governments and by private industry. Common applications include military operations, archaeology, urban-industrial planning and maintenance, and environment studies. *See generally id.* at chs. 6-14. For additional information about earth observation satellites and their applications, see generally HAROLD HOUGH, SATELLITE SURVEILLANCE (1991).

29. Edmund L. Andrews, *U.S. to Allow Sale of the Technology for Spy Satellites*, N.Y. TIMES, Mar. 11, 1994, at A1 (referring to the concerns of some security experts in response to the Clinton Administration's decision to make these systems available to commercial customers internationally).

30. The military continues to develop FLIR technology. The United States Army Chief of Staff, describing the development of advanced military technology for the twenty-first century, includes the new 2d generation FLIR technology. *Fiscal Year 1995 Budget and the Posture of the United States Army, Before the Subcomm. on Defense Comm. on Appropriations*, 103d Cong., 2d Sess. 169-71 (1994) (statement of General Gordon R. Sullivan, Chief of Staff, United States Army) [hereinafter General Sullivan statement].

31. Absolute zero is expressed as 0 K on the Kelvin scale. It is equal to -459.69 degrees on the Fahrenheit scale and -273.16 degrees on the Celsius scale. AVERY & BERLIN, *supra* note 23, at 2. At a temperature of absolute zero, all random motions of atoms and molecules cease. *Id.*

both day and night.[32] FLIRs are equipped with video monitors that display immediate, high resolution images of the objects. Distinctive temperature contrasts are shown by displaying tonal or color variations across the objects' surfaces. FLIRs are very portable and are often operated from ground-based vehicles, airplanes, and helicopters.[33] Recently, high-resolution hand-held infrared viewers have also become available.[34]

FLIRs are sensitive enough to remotely identify the heat[35] generated by a heart beat. Thus, they are useful in search and rescue missions, for outdoor night surveillance, and to detect and analyze activity occurring within enclosed structures. FLIRs are also used for a variety of commercial applications.[36]

FLIRs are currently being used in the United States by domestic law enforcement agencies.[37] During its siege of the Branch Davidian

32. FLIR systems focus thermal infrared radiation with an optical system that is equipped with scan mirrors. These mirrors move the image over detectors, which in turn produce variable-voltage signals. The signals are amplified and processed into standard video signals. *Id.* at 133-34.

33. *See id.* at 133-34.

34. *See generally Thermal Imaging: The Language of Heat*, CERAMIC INDUSTRY, Oct. 1993, at 43, 44 (reporting that Flir Systems Inc. (FSI) of Portland, Oregon, had recently introduced "what [FSI] considers a revolutionary hand-held infrared viewer." Known as the Prism, the viewer offers high-resolution video images, and is ideal for security and surveillance applications, as well as a broad range of industrial applications); *see also Handheld, Low-Cost IR Viewer Spots Thermal Images*, 14 ADVANCED MANUFACTURING TECH., July 15, 1993, at 12 (The device combines innovative technological advances into an eight pound package priced below $35,000).

35. "Infrared radiation is generally associated with heat because heat is its most easily detected effect." ACADEMIC AMERICAN ENCYCLOPEDIA 175 (1992).

36. *See, e.g., Handheld, Low-Cost IR Viewer Spots Thermal Images, supra* note 34. Thermal imaging devices are used for a broad range of commercial applications, including environmental monitoring, predictive and preventive maintenance of electrical and mechanical systems, structural analysis, and process control. *Id.*

37. *See GM Hughes, Texas Instruments Introduce Night Vision System to Help Police See in the Dark*, PR Newswire, Oct. 17, 1993 (Financial News), *available in* LEXIS, Nexis NEWS Library, PRNEWS File, at *1 (A new product, the NIGHTSIGHT thermal imaging system, is shown at the International Association of Chiefs of Police convention by two leading defense electronic firms.); *Mesa, Ariz., Police Receive Two MD 500E Helicopters*, PR Newswire, Oct. 6, 1993 (Financial News), *available in* LEXIS, Nexis NEWS Library, PRNEWS File, at *1 (helicopters are equipped with FLIR systems); Kelly Pearce, *A New Meaning for 'Hot Pursuit'; Infrared Tool Helps Copter Crews Track Prey*, ARIZ. REPUBLIC, Jan. 18, 1994, at B1 (describing the use of FLIR-equipped helicopters by city, county, and state law enforcement agencies, to fight crime, spot fires, and conduct search and rescues. One officer said that, with the FLIR systems, "[w]e have found people hiding upstairs, in trees, and in bushes . . . . [T]he system is a terrific time saver. It takes the guesswork out of police work"); *Pennsylvania State Police Helicopters Get Infrared Night Eyes*, PR Newswire, Nov. 15, 1993 (State and Regional News), *available in* LEXIS, Nexis NEWS Library, PRNEWS File, at *1 (reporting the installation of airborne thermal imaging systems, funded by a $282,000 federal grant); Paul Proctor, *Helicopter Flexibility Attracts Police Use*, 139 AVIATION WK. & SPACE TECH., Aug. 9, 1993, at 42 (A 1992 survey by the Airborne Law Enforcement Association showed that airborne units participated in more than 27,000 arrests. Survey respondents represented only 40% of the association's membership); Paul Valentine, *Putting the Heat on Crime at Night: State Police Helicopters Use Infrared Cameras*

complex in Waco, Texas, the FBI used FLIRs to monitor outdoor areas at night and to determine whether specific rooms were occupied.[38] The United States Justice Department's Drug Enforcement Agency reports that thermal imaging technology is commonly used, in conjunction with other surveillance methods, to detect indoor marijuana growing operations.[39]

Some federal and state agencies have requested assistance from the United States Department of Defense, asking that military aircraft equipped with FLIRs be used to produce infrared images of buildings on private American land.[40] According to the Justice Department's Office of Legal Counsel, such assistance should not constitute a

to Detect Wrongdoers, WASH. POST, Oct. 21, 1993 (Maryland Weekly), at Md. 1, 4 (describing Maryland's purchase of FLIRs and French-made Aerospatiale Dauphin choppers and the recent identification of an in-door marijuana operation); Gene Warner, *City Police Take to the Sky to Cope with Criminals*, BUFFALO NEWS, Sept. 22, 1993, at 1 (Buffalo, New York, "Sky Cops" are patrolling the streets); *cf.* Michael Barnes, *Blimps on the Rise*, TECH. REV., Jan. 1994, at 46, 51-52 (To combat bombings in Britain, the United Kingdom Ministry of Defense plans to equip blimps, which operate at 5,000 feet, with thermal imaging systems to track people at night, and with directional microphones to intercept ground conversations).

38. *FBI Kept Tabs on Cult with High-Tech Gear*, ST. LOUIS POST-DISPATCH, Apr. 21, 1993, at 12A. "Law enforcement sources said radio transmitters smaller than cigarettes had been smuggled into the cult's compound, while heat-sensitive surveillance equipment 'watched' the compound from outside.... One source said agents used 'flirs'... to watch outdoor areas of the compound at night and even determine whether specific rooms were occupied." *Id.*

39. Lisa J. Steele, *Waste Heat and Garbage: The Legalization of Warrantless Infrared Searches*, 29 CRIM. L. BULL. 29, 39 (1993) (citing DRUG ENFORCEMENT AGENCY, UNITED STATES DEP'T OF JUSTICE, DRUG ENFORCEMENT AGENCY, 1990 DOMESTIC CANNABIS ERADICATION AND SUPPRESSION PROJECT FINAL REPORT 23 (1990) [hereinafter DEA 1990 REPORT]). Indoor marijuana operations are immune to visual observations from outdoors. They are detectible only by the amount of water and electricity used and by the heat produced by grow lights. *Id.* at 20. During 1990, "off the shelf thermal video technology . . . was utilized in numerous locations throughout the United States to support justification of a probable cause conclusion. The thermal surveillance data along with other investigative information were used in numerous search warrant affidavits." *Id.* at 39 (citing DEA 1990 REPORT, *supra* at 29); *see also* Tim Bryant, *DEA Targets Indoor Pot Growers*, ST. LOUIS POST-DISPATCH, May 9, 1993, at 1D (describing DEA surveillance techniques in identifying indoor, hydroponic marijuana growing operations. The article also reported an incident where police, expecting to find a home indoor marijuana farm, instead found an indoor orchid garden); *see generally* W. Conard Holton, *Shedding new light on crime; includes related articles; A Special Staff Report: Tales From the Dark Side*, PHOTOTONICS SPECTRA, Dec. 1992, at 52. The author describes the growth of photonic technologies, including FLIRS, in law enforcement. He reports that the federal Office of National Drug Control Policy's (ONDCP) Counter-Drug Technology Assessment Center (CTAC) "acts as the central research and development coordinating group for drug-fighting organizations like the FBI, DEA, Coast Guard, Customs Service, DARPA and the DoD." *Id.* at 58. The office has recently focused on the development of wide-area surveillance and nonintrusive inspections, including "the use of radar, IR, UV, optical sensors and data-management and information-exploitation networks." *Id.* at 59.

40. Timothy E. Flanigan, Acting Assistant Attorney General, Office of Legal Counsel, *Fourth Amendment Implications of Military Use of Forward Looking Infrared Radars Technology to Assist Civilian Law Enforcement Agencies*, 1992 WL 479541 at *1 (O.L.C. Mar. 4, 1992).

"search" under the Fourth Amendment.[41] Nor, according to that office, should such military participation constitute a "search" prohibited under Chapter 18 of Title 10 of the United States Code.[42] This statute delineates the extent to which the military may provide assistance to civilian law enforcement, and requires the Secretary of Defense to prevent "direct participation by a member of the Army, Navy, Air Force, or Marine Corps in a search, seizure, arrest, or other similar activity."[43]

During the 1990s, individuals challenged the constitutionality of warrantless FLIR inspections of their privately owned buildings. The diverse court opinions in these cases demonstrate a lack of consensus on how to apply the modern Fourth Amendment threshold analysis, particularly with regard to sense-enhanced surveillance. The differences reflect a clash among Supreme Court opinions, which fail to articulate a coherent approach to Fourth Amendment threshold analysis where the government uses advanced investigative techniques.

II. EVOLUTION OF THE FOURTH AMENDMENT THRESHOLD ANALYSIS

A. The Foundation

The Fourth Amendment is founded upon the 500 year old common law maxim that a "man's house is his castle; and while he is quiet, he is well guarded as a prince in his castle."[44] In his 1868 treatise on

41. *Id.* The Office of Legal Counsel was responding to a request for an opinion from the Department of Defense's General Counsel. Although Defense's General Counsel had concluded that FLIR surveillance of houses constituted a Fourth Amendment search, the Department of Justice disagreed. *Id.*

42. J. Michael Lutting, Assistant Attorney General, Office of Legal Counsel, *Military Use of Infrared Radars Technology to Assist Civilian Law Enforcement Agencies*, 1991 WL 499885 at *1 (O.L.C. Feb. 19, 1991) The Office was responding to a request from the Department of Defense's General Counsel, asking whether federal statutes prohibit Defense from assisting the DEA and other agencies, in the use of FLIRs to identify or confirm suspected illegal drug production. The Justice Department responded that the assistance is authorized by 10 U.S.C. §§ 374-75). *Id.*

The Justice Department said that "the meaning of the term 'search'" in § 375 was not intended to be coextensive with the meaning of the same term in the Fourth Amendment. *Id.* at 3.

> Instead, when Congress used the term 'search' in section 375, it intended that the term encompass at most only searches involving physical contact with civilians or their property, and perhaps only searches involving physical contact that are likely to result in a direct confrontation between military personnel and civilians.

Id.

43. *Id.* at 2 (referring to 10 U.S.C. §§ 371-75 and quoting § 375).

44. Ken Gormley, *One Hundred Years of Privacy*, 1992 WIS. L. REV. 1335, 1358 (1992) (citing Paxton's Case, Superior Ct. 1761, *reprinted in* Quincy's Mass. Rep. 1761-62, 51 (1865)). The maxim came from the English case of Y.B. 21 Hen. 7, fo. 39, pl. 50 (1499), *cited in* 2 THE REPORTS OF SIR JOHN SPELLMAN 316 n.2 (J. H. Baker ed., 1978). Gormley, *supra* at 1358.

Constitutional Limitations, Judge Thomas Cooley wrote that the Fourth Amendment incorporates this maxim, "secur[ing] to the citizen immunity in his home against the prying eyes of the government, and protection in person, property, and papers even against the process of law, except in a few specified cases."[45]

The United States Supreme Court considered the Fourth Amendment threshold question for the first time in 1886, in *Boyd v. United States*.[46] The case concerned a customs revenue statute that allowed a court to order a defendant to produce his books and papers in a civil forfeiture action. The *Boyd* Court concluded that the Fourth Amendment's restrictions on government searches were not limited to intrusions on private premises.[47] It held that compulsory production of private books and papers was the equivalent of a search and seizure.[48]

The *Boyd* Court found guidance for its decision in the events that precipitated the American revolution, and which provided the impetus for including the Fourth Amendment within the Constitution. The opinion recalled the infamous colonial practice of issuing writs of assistance that empowered government agents, at their own discretion, to search private premises for contraband.[49] The Court cited James Otis, who decried this practice which put "the liberty of every man in the hands of every petty officer" and thus constituted "the worst instrument of arbitrary power, the most destructive of English liberty and the fundamental principle of law, that ever was found in an English law book."[50] The *Boyd* Court also referred to the principles

Gormley also quotes William Pitt the Elder's Speech on the Excise Bill:

> The poorest man may in his cottage bid defiance to all the force of the Crown. It may be frail—its roof may shake—the wind may blow through it—the storm may enter, the rain may enter—but the King of England cannot enter—all his force dares not cross the threshold of the ruined tenement!

Gormley, *supra* at 1358 (citing William Pitt, Speech on the Excise Bill, *quoted in* Frank v. Maryland, 359 U.S. 360, 378-79 (1959) (Douglas, J., dissenting) (citing 15 HANSARD, PARLIAMENTARY HISTORY OF ENGLAND (1753-1765) at 1307)).

45. Gormley, *supra* note 44, at 1359-60, (citing THOMAS M. COOLEY, A TREATISE ON THE CONSTITUTIONAL LIMITATIONS WHICH REST UPON THE LEGISLATIVE POWER OF THE STATES OF THE AMERICAN UNION 299 (1st ed. 1868)).

46. 116 U.S. 616 (1886).

47. *Id.* at 622.

48. *Id.* The Court also held that the search and seizure was unreasonable because it violated the Fifth Amendment's prohibition against compelling the defendant to be a witness against himself. *Id.* at 634-35.

49. *Id.* at 625.

50. *Id.* (quoting THOMAS M. COOLEY, A TREATISE ON THE CONSTITUTIONAL LIMITATIONS WHICH REST UPON THE LEGISLATIVE POWER OF THE STATES OF THE AMERICAN UNION 301-03 (5th ed. 1883)). James Otis made this pronouncement in 1761, during a famous debate which the *Boyd* Court characterized as "perhaps the most prominent event which inaugurated the resistance of the colonies to the oppressions of the mother country." *Id.*

set forth in Lord Camden's judgment in *Entick v. Carrington*[51] and concluded that "[i]t is not the breaking of his doors, and the rummaging of his drawers, that constitutes the essence of the offence; but it is the invasion of his indefeasible right of personal security, personal liberty and private property."[52]

Writing for the *Boyd* majority, Justice Bradley stated that the Fourth Amendment must be liberally construed and admonished the courts against the dangers of a narrow construction. He said that although an order to produce papers was "divested of many of the aggravating incidents of actual search and seizure," it nonetheless "contains their substance and essence, and effects their substantial purpose."[53] Referring to the government's methods, he added:

> It may be that it is the obnoxious thing in its mildest and least repulsive form; but illegitimate and unconstitutional practices get their first footing in that way, namely, by silent approaches and slight deviations from legal modes of procedure. This can only be obviated by adhering to the rule that constitutional provisions for the security of person and property should be liberally construed. A close and literal construction deprives them of half their efficacy, and leads to gradual depreciation of the right, as if it consisted more in sound than in substance. It is the duty of courts to be watchful for the constitutional rights of the citizen, and against any stealthy encroachments thereon.[54]

Forty years later, in his dissent in *Olmstead v. United States*,[55] Justice Brandeis wrote that *Boyd* "will be remembered as long as civil liberty lives in the United States."[56]

In *Olmstead*, the Court considered whether the Fourth Amendment was implicated when government agents wiretapped the telephone conversations of persons suspected of violating the Prohibition Act.[57] In a 5-4 decision, the Court held that the Fourth Amendment did not apply. The majority concluded that there was no Fourth Amendment search because the wiretapping did not involve a physical

51. 19 Howell's State Trials 1029 (1765). This celebrated English case was "fresh in the memories of those who achieved our independence and established our form of government." *Boyd*, 116 U.S. at 625. The decision condemned the practice of issuing general warrants to search houses and seize books that could be used in prosecutions for libel. *Id.*

52. *Boyd*, 116 U.S. at 630.

53. *Id.* at 635.

54. *Id.*

55. 277 U.S. 438 (1928).

56. *Id.* at 474 (Brandeis, J., dissenting).

57. *Id.* at 438. Federal prohibition officers inserted small wires along ordinary telephone wires. The taps were made without trespass upon the defendants' property. *Id.* at 457.

trespass or an examination of tangible objects.[58] The Court noted that telephone users intentionally project their voices over wires outside their houses, and held that Fourth Amendment protections do not extend to interceptions of voices outside the protected area of those houses.[59] Accordingly, in subsequent cases involving electronic eavesdropping, the Court's threshold test depended upon whether the means for establishing the wiretap included, at the very least, minimal physical penetration of a constitutionally protected building.[60]

Justice Brandeis criticized *Olmstead*'s narrow definition of a search. He said that the Framers had protected the people from government violations of their "right to be let alone—the most comprehensive of rights and the right most valued by civilized men. To protect that right, every unjustifiable intrusion by the Government upon the privacy of the individual, whatever the means employed, must be deemed a violation of the Fourth Amendment."[61] He warned that "[t]he progress of science in furnishing the Government with means of espionage is not likely to stop with wire-tapping."[62]

58. *Id.* at 464. "The evidence was secured by the use of the sense of hearing and that only. There was no entry of the houses or offices of the defendants." *Id.* The wiretap violated a Washington State statute that made wiretapping a misdemeanor. *Id.* at 468-69. However, the Court held that violation of a state law did not warrant exclusion of the evidence in a federal case. *Id.* at 469.

59. *Id.* at 466.

60. *See* Clinton v. Virginia, 377 U.S. 158 (1964); Silverman v. United States, 365 U.S. 505 (1961); Goldman v. United States, 316 U.S. 129 (1942).

61. *Olmstead*, 227 U.S. at 478 (Brandeis, J., dissenting). Justice Brandeis stated:

> It is . . . immaterial where the physical connections with the telephone wires leading into the defendant's premises was made. And it is also immaterial that the intrusion was made in aid of law enforcement. Experience should teach us to be most on our guard to protect liberty when the Government's purposes are beneficent. Men born to freedom are naturally alert to repel invasion of their liberty by evil-minded rulers. The greatest dangers to liberty lurk in insidious encroachment by men of zeal, well-meaning but without understanding.

Id.

62. *Id.* at 474; *see generally* Gormley, *supra* note 44. The author discusses the right to privacy in the United States, one hundred years after Louis Brandeis and Samuel Warren authored their famous article on privacy law. Samuel D. Warren & Louis D. Brandeis, *The Right to Privacy*, 4 HARV. L. REV. 193 (1890). While on the Supreme Court, Justice Brandeis championed the argument that both the Fourth and Fifth Amendments must be held to protect against the government's unjustified use of new technologies. *See, e.g, Olmstead*, 277 U.S. at 438 (Brandeis, J., dissenting) ("Discovery and invention have made it possible for the Government, by means far more effective than stretching upon the rack, to obtain disclosure in court of what is whispered in the closet"). Gormley notes that Justice Brandeis, who was a son of Jewish immigrants who fled Prague because of increasing government restrictions on liberty, "was clearly cognizant of the dangers posed to racial and religious minorities if the government's intrusions into homes and personal property were allowed to grow unchecked with each new piece of technology." Gormley, *supra* note 44, at 1438.

Thirty-nine years later, the Court overruled *Olmstead* in the landmark decision of *Katz v. United States*.[63] In *Katz*, FBI agents attached a listening device to the outside of a public telephone booth. The Court held that the agents had conducted a Fourth Amendment search and seizure when they electronically listened to and recorded the telephone conversation.[64] The Court reasoned that the individual had shut the door of the telephone booth and paid the toll for a private phone conversation.[65] Consequently, the agents' actions violated an expectation of privacy upon which the speaker justifiably relied.[66]

Thus, the Court in *Katz* rejected the *Olmstead* inquiry. It stated that a focus on protected physical "areas" deflected attention from the issues.[67] "The fact that the electronic device . . . did not happen to penetrate the wall . . . can have no constitutional significance."[68] Concurring, Justice Harlan regarded the pre-*Katz* focus on physical penetrations as "bad physics as well as bad law, for reasonable expectations of privacy may be defeated by electronic as well as physical invasion."[69]

The *Katz* majority proclaimed:

> [T]he Fourth Amendment protects people, not places. What a person knowingly exposes to the public, even in his own home or office, is not a subject of Fourth Amendment protection. But what he seeks to preserve as private, even in an area accessible to the public, may be constitutionally protected.[70]

Justice Harlan attempted to clarify the majority's holding by advancing a two-part rule that could be applied without reference to "areas."[71] He proposed that Fourth Amendment protections apply wherever a person "exhibit[s] an actual (subjective) expectation of privacy"[72] which "society is prepared to recognize as reasonable."[73]

63. 389 U.S. 347 (1967); *see generally* LAFAVE, *supra* note 5.

64. *Katz*, 389 U.S. at 353. The Court also held that the search and seizure were unreasonable in the absence of a search warrant. *Id.* at 358.

65. *Id.* at 352.

66. *Id.* at 353.

67. *Id.* at 351.

68. *Id.* at 353.

69. *Id.* at 362 (Harlan, J., concurring).

70. *Katz*, 389 U.S. at 351-52.

71. *Id.* at 361 (Harlan, J., concurring). "As the Court's opinion states, 'the Fourth Amendment protects people, not places.' The question, however, is what protection it affords to those people." *Id.*

72. *Id.* "Thus a man's home is, for most purposes, a place where he expects privacy, but objects, activities, or statements that he exposes to the 'plain view' of outsiders are not 'protected' because no intention to keep them to himself has been exhibited." *Id.*

73. *Id.* For example, "conversations in the open would not be protected against being overheard, for the expectation of privacy under the circumstances would be unreasonable." *Id.*

These statements, from both the majority opinion and Justice Harlan's concurring opinion, laid the foundation for virtually all modern Fourth Amendment analysis.

Katz marked a second beginning for Fourth Amendment threshold analysis.[74] Like *Boyd*, *Katz* re-centered the Court's analysis upon the invasion of a valuable privacy interest, rather than the physical methods employed to effect that invasion.[75] *Katz* promised the people Fourth Amendment protection against arbitrary, electronic invasions of legitimate privacy interests.

However, *Katz* did not declare an absolute right to privacy. It recognized that an individual may relinquish a privacy interest by inviting public observation.[76] This recognition required the Court to focus Fourth Amendment threshold review, at least in part, upon the actions taken by the individual to preserve or defeat a justifiable expectation of privacy. Privacy interests could be assessed by analyzing the subjective expectations of an individual,[77] in light of the objective expectations of society.[78]

Four years after *Katz*, Justice Harlan expounded upon his expectation of privacy rule in his dissenting opinion in *United States v. White*.[79] In *White*, a plurality applied the new *Katz* analysis in conjunction with a risk analysis. The plurality found that the government may electronically monitor a telephone conversation when one party consents to such electronic surveillance.[80] The plurality further found that there can be no reasonable expectation of privacy once an individual knowingly confides in another party.[81] When people assume the risk of misplacing their confidence in another party, they no longer have a justifiable expectation of privacy protected by the Fourth Amendment.[82]

74. *See, e.g.*, Gutterman, *supra* note 4, at 662.

75. "Although *Katz* has become the basis for examining the parameters of the 'new' fourth amendment, the privacy concept it enunciated had its roots deeply embedded in *Boyd*." *Id.* *Katz* "firmly held that a privacy value-oriented analysis would supplant the traditional property approach. The right of the individual to be left alone to live his daily life secure against arbitrary invasions by governmental officials appeared once again to become the basic value protected by the fourth amendment." *Id.* at 663.

76. *Id.* at 672. "By focusing on the precautions that Katz took, the Court disclosed that it might not believe in an 'entitlement theory,' a right of the people to expect their government to respect their privacy." *Id.* at 664.

77. *See supra* note 71 and accompanying text.

78. *See supra* note 72 and accompanying text.

79. 401 U.S. 745, 768-95 (1971) (Harlan, J., dissenting).

80. *Id.* at 751-53 (plurality opinion).

81. *Id.*

82. *Id.*

Justice Harlan disagreed with the *White* plurality's application of the *Katz* standard. It had erroneously hinged its inquiry entirely upon an analysis of the risks assumed among private individuals. The plurality had failed to address the central concern of the Fourth Amendment, which is whether the government's conduct encroached upon the privacy expectations of citizens in a free society. Citing *Boyd*, he reminded the Court, "It matters little that consensual transmittals are less obnoxious than wholly clandestine eavesdrops."[83] He said that the threshold analysis must "transcend the search for subjective expectations or legal attribution of assumptions of risk. Our expectations, and the risks we assume, are in large part reflections of laws that translate into rules the customs and values of the past and present."[84] Judges should not "merely recite the expectations and risks."[85] Instead, the critical question for the Court is whether under our system of government, reflected in the Constitution, the risk of an electronic eavesdropper or observer should be imposed upon citizens without Fourth Amendment protection.[86]

> Inescapably, one contemplating illegal activities must realize and risk that his companions may be reporting to the police. . . . [I]f he has no doubts, or allays them, or risks what doubt he has, the risk is his. . . . In terms of what his course will be, what he will or will not do or say, we are unpersuaded that he would distinguish between probable informers on the one hand and probable informers with transmitters on the other.

Id. at 752.

83. *Id.* at 789 (Harlan, J., dissenting). Justice Harlan pointed out that *Boyd* had rejected the idea that Fourth Amendment protections depended upon the mitigating aspects of the government's conduct. *Id.* The *White* decision had failed to heed *Boyd's* warning about the "'illegitimate and unconstitutional practices'" which may be "'divested of many of the aggravating incidents of actual search and seizure, yet . . . contain[ ] their substance and essence, and effect[ ] their substantial purpose. . . .'" *Id.* (quoting *Boyd*, 116 U.S. at 635).

84. *Id.* at 786.

85. *Id.*

86. *Id.* Justice Douglas also wrote a vehement dissent. He expressed a profound concern about the use of high technology in general, and remote sensing in particular, to intrude upon and examine the citizens. He said:

> The issue in this case is clouded and concealed by the very discussion of it in legalistic terms. What the ancients knew as "eavesdropping," we now call "electronic surveillance"; but to equate the two is to treat man's first gunpowder on the same level as the nuclear bomb. Electronic surveillance is the greatest leveler of human privacy ever known. How most forms of it can be held "reasonable" within the meaning of the Fourth Amendment is a mystery. To be sure, the Constitution and Bill of Rights are not to be read as covering only the technology known in the 18th century. Otherwise its concept of "commerce" would be hopeless when it comes to the management of modern affairs.

Id. at 756 (Douglas J., dissenting).

Justice Douglas further stated:

> Today no one perhaps notices because only a small, obscure criminal is the victim. But every person is the victim, for the technology we exalt today is everyman's master. Any doubters should read Arthur R. Miller's The Assault On Privacy (1971). After describing the monitoring of conversations and their storage in data banks, Professor Miller goes on to describe "human monitoring" which he calls the "ultimate step in mechanical snooping"—a device for spotting unorthodox or aberrational behavior across a wide

B. The Modern Court's Threshold Analysis

1. Accessibility and Risk

Since *Katz* and *White*, the Court has considered various and progressively sophisticated government investigatory tactics in the context of the Fourth Amendment. The Court's decisions, and their progeny in the lower courts, have shaped the contours of acceptable government conduct toward criminal suspects and non-suspects alike, and delineated society's "reasonable" expectations of privacy. Consistent with *White*, a highly divided Court has applied a strict risk analysis to determine whether a protectible expectation of privacy has been violated.

The modern Court defines a Fourth Amendment search as a government act that satisfies both prongs of the *Katz* two-prong analysis. First, the Court looks to see whether a citizen has demonstrated a subjective expectation of privacy. If there is no such demonstration, the Fourth Amendment inquiry ends.

Individuals easily defeat their own claims to Fourth Amendment privacy rights. By being a participant in modern society, individuals often fail to demonstrate the requisite expectation of privacy. Anything "a person knowingly exposes to the public, even in his own home or office," is generally viewed by the Court as an assumed risk, and therefore, "not a subject of Fourth Amendment protection."[87]

An early example of this analysis occurred in *Smith v. Maryland*,[88] where the Court found that by using telephones, individuals knowingly expose the numbers they dial to the telephone company. Consequently, the Court held that the government may, without justification or notice, enlist the cooperation of a telephone company to electronically identify the telephone numbers dialed from a home telephone.[89]

> spectrum. "Given the advancing state of both the remote sensing art and the capacity of computers to handle an uninterrupted and synoptic data flow, there seem to be no physical barriers left to shield us from intrusion."

Id. at 757 (quoting ARTHUR R. MILLER, THE ASSAULT ON PRIVACY 46 (1971).

87. *See supra* text accompanying note 69.

88. 442 U.S. 735 (1979).

89. *Id.* In *Smith*, the government used a pen register device which can mechanically monitor a private telephone's electrical impulses. They used the device to identify the telephone numbers dialed from an individual's home.

Justice Marshall wrote in dissent, joined by Justice Brennan, that it was "idle to speak of 'assuming' risks in contexts where, as a practical matter, individuals have no realistic alternative." *Id.* at 750 (Marshall, J., dissenting).

> Implicit in the concept of assumption of risk is some notion of choice. At least in the third-party consensual surveillance cases, which first incorporated risk analysis into Fourth Amendment doctrine, the defendant presumably had exercised some discretion

The *Smith* majority acknowledged that in some cases it would have to apply only a normative inquiry to determine whether a legitimate expectation of privacy exists.[90] "[W]here an individual's subjective expectations had been 'conditioned' by influences alien to well-recognized Fourth Amendment freedoms, those subjective expectations obviously could play no meaningful role in ascertaining what the scope of Fourth Amendment protection was."[91]

Where the Court recognizes that an individual has demonstrated a subjective expectation of privacy, or the Court assumes so *argu-*

> in deciding who should enjoy his confidential communications. . . . By contrast here, unless a person is prepared to forgo use of what for many has become a personal or professional necessity, he cannot help but accept the risk of surveillance. . . .

Id. (citations omitted).

> Permitting governmental access to telephone records on less than probable cause may thus impede certain forms of political affiliation and journalistic endeavor that are the hallmark of a truly free society. Particularly given the Government's previous reliance on warrantless telephonic surveillance to trace reporters' sources and monitor protected political activity. . . . I am unwilling to insulate use of pen registers from independent judicial review.

Id. at 751; *see also* United States v. Miller, 425 U.S. 435 (1976). In *Miller* the Court held that, by entrusting personal financial information to a bank, an individual had no Fourth Amendment protection against government scrutiny of bank records which contained that personal information. In contrast to the voluntary cooperation of the telephone company in *Smith*, the bank in *Miller* provided the records in response to a subpoena. The bank maintained these records pursuant to the Bank Secrecy Act. The Court held, "The depositor takes the risk, in revealing his affairs to another, that the information will be conveyed by that person to the Government. . . ." *Id.* at 443 (citing United States v. White, 401 U.S. 745, 751-52 (1971)). The Court stated:

> This analysis is not changed by the mandate of the Bank Secrecy Act that records of depositors' transactions be maintained by banks. . . . [E]ven if the banks could be said to have been acting solely as Government agents in transcribing the necessary information and complying without protest with the requirements of the subpoenas, there would be no intrusion upon the depositors' Fourth Amendment rights.

Id.

90. *Smith*, 442 U.S. at 741 n.5.

> For example, if the Government were suddenly to announce on nationwide television that all homes henceforth would be subject to warrantless entry, individuals thereafter might not in fact entertain any actual expectation of privacy regarding their homes, papers, and effects. Similarly, if a refugee from a totalitarian country, unaware of this Nation's traditions, erroneously assumed that police were continuously monitoring his telephone conversations, a subjective expectation of privacy regarding the contents of his calls might be lacking as well.

Id.

In dissent, Justice Marshall argued that the majority had not adequately defined the circumstances under which a normative inquiry would supplant the subjective inquiry. *Id.* at 750 (Marshall, J., dissenting).

> [T]o make risk analysis dispositive in assessing the reasonableness of privacy expectations would allow the government to define the scope of Fourth Amendment protections. For example, law enforcement officials, simply by announcing their intent to monitor the content of random samples of first-class mail or private phone conversations, could put the public on notice of the risks they would thereafter assume in such communications.

Id. at 750 (citing Amsterdam, *supra* note 2, at 384, 407).

91. *Smith*, 442 U.S. at 740.

endo,[92] the Court considers the second prong of the analysis. An individual's expectation must be one that society is prepared to consider reasonable.

The modern Court's second prong may be described as a Catch-22 analysis. It acknowledges that "what [a person] seeks to protect as private, even in an area accessible to the public, may be constitutionally protected."[93] However, the Court generally finds that society would not consider it reasonable to expect privacy in anything that is accessible to the public. Society's view of what can be reasonably expected as private is cast in light of what can be realistically, even cynically, expected to remain private. The Court rarely asks, except rhetorically, whether the government's intrusion infringed upon societal values protected by the Fourth Amendment. Consequently, like the first prong, Fourth Amendment claims are easily defeated by the second prong.

In *California v. Ciraolo*,[94] the Court considered whether police violated a reasonable expectation of privacy when they flew a plane over an individual's home to look at and photograph the backyard. The private yard was hidden at ground level by a six-foot outer fence and a ten-foot inner fence. The Court found that the individual had demonstrated a subjective expectation of privacy by surrounding the property with fences.[95] It also stated that, under the *Katz* test, the Court must consider "whether the government's intrusion infringes upon the personal and societal values protected by the Fourth Amendment."[96]

92. *See, e.g*, California v. Ciraolo, 476 U.S. 207, 211-12 (1986). While the defendant had demonstrated a subjective expectation of privacy from street-level observation, the Court found that it was unclear whether the defendant expected privacy from aerial observation. *Id.*; *see also infra* note 94.

93. Katz v. United States, 389 U.S. 347, 351 (1967).

94. 476 U.S. 207. The police received an anonymous tip that marijuana was growing in the defendant's backyard. *Id.* at 209.

95. *Id.* at 211. "Clearly—and understandably—respondent has met the test of manifesting his own subjective intent and desire to maintain privacy as to his unlawful agricultural pursuits .... It can be reasonably assumed that the 10-foot fence was placed to conceal the marijuana crop from at least street-level views." *Id.* However, continuing its analysis, the Court did not conclude that this alone was sufficient to satisfy even the first prong of the *Katz* test.

> Yet a 10-foot fence might not shield these plants from the eyes of a citizen or a policeman perched on the top of a truck or a two-level bus. Whether respondent therefore manifested a subjective expectation of privacy from all observations of his backyard, or whether instead he manifested merely a hope that no one would observe his unlawful gardening pursuits, is not entirely clear in these circumstances.

Id. at 211-12.

96. *Id.* at 212 (citations omitted).

Nonetheless, in a 5-4 decision, the Court held that the individual's expectation of privacy did not pass the *Katz* test. The police had observed only what was in "plain view."[97] "Any member of the public flying in this airspace who glanced down could have seen everything that these officers observed."[98] Therefore, in an age where private and commercial flight is routine, it was not reasonable to expect that the Constitution affords protection from aerial observation with the naked eye.[99]

Four Justices in *Ciraolo* joined in a single dissenting opinion. They said that the majority, without sufficient explanation, had divested modern citizens of their longstanding Fourth Amendment privacy interest in an enclosed curtilage,[100] simply because technology had enabled the public to use airspace for travel.[101] They objected to

97. *Id.* at 215. The Court quoted Justice Harlan's concurring opinion in *Katz*. *Id.*

98. *Id.* at 213-14. The Court recognized that the officers had been investigating the curtilage next to the individual's home. The common law recognizes the curtilage as an area associated with the "'sanctity of a man's home and the privacies of life.'" *Id.* at 212 (quoting *Boyd*, 116 U.S. 616, 630 (1886)).

> The protection afforded the curtilage is essentially a protection of families and personal privacy in an area intimately linked to the home, both physically and psychologically, where privacy expectations are most heightened. . . .
>
> That the area is within the curtilage does not itself bar all police observation. The Fourth Amendment protection of the home has never been extended to require law enforcement officers to shield their eyes when passing by a home on public thoroughfares. Nor does the mere fact that an individual has taken measures to restrict some views of his activities preclude an officer's observations from a public vantage point where he has a right to be and which renders the activities clearly visible.

Id. at 212-13.

99. *Id.* at 215. The Court stated:

> One can reasonably doubt that in 1967 Justice Harlan considered an aircraft within the category of future "electronic" developments that could stealthily intrude upon an individual's privacy. In an age where private and commercial flight in the public airways is routine, it is unreasonable for respondent to expect that his marijuana plants were constitutionally protected from being observed with the naked eye from an altitude of 1,000 feet. The Fourth Amendment simply does not require the police traveling in the public airways at this altitude to obtain a warrant in order to observe what is visible to the naked eye.

Id.

100. The Court recently reaffirmed in Dow Chemical Co. v. United States, 476 U.S. 227 (1986), that the curtilage doctrine evolved to "protect much the same kind of privacy as that covering the interior of a structure." The Court in *Dow* emphasizes, moreover, that society accepts as reasonable citizens' expectations of privacy in the area immediately surrounding their homes. *Ciraolo*, 476 U.S. at 220-21 (Powell, J., dissenting).

The *Ciraolo* dissent noted:

> The Court omits any reference to the fact that respondent's yard contained a swimming pool and a patio for sunbathing and other private activities. At the suppression hearing, respondent sought to introduce evidence showing that he did use his yard for domestic activities. The trial court refused to consider that evidence. . . .

Id. at 222 n.7.

101. Had the officers climbed the fences, rather than flown overhead, to peer into the curtilage, they would have violated the Fourth Amendment's protections. *Id.* at 222 (Powell, J., dissenting).

the finding that, by failing to build barriers *over* their property, people knowingly expose their residences to the public. People may willingly risk the remote possibility that private travelers will catch a fleeting, anonymous glimpse of their property. However, it does not follow that the people thereby willingly risk the government's purposeful surveillance from the same vantage point.[102]

The second prong of the Court's threshold analysis may be applied without regard to the laws that bear upon a frustration of privacy. In *California v. Greenwood*,[103] the Court considered whether the Fourth Amendment was applicable where government agents, throughout a three month period, conducted a warrantless search and seizure[104] of garbage left for collection, in sealed opaque bags, on the curb outside a home. The individuals had left the garbage on the curbside pursuant to the commands of local laws regarding garbage disposal. However, only the dissenting Justices considered these laws, as well as other local laws, as factors.

The *Greenwood* majority reversed the California Superior Court's decision[105] and held that by exposing their garbage to the public the individuals defeated any Fourth Amendment claim. It concluded that society would not consider it reasonable to expect privacy in the contents of a sealed trash bag because it is "common knowledge that plastic garbage bags left on or at the side of a public street are readily accessible to animals, children, scavengers, snoops, and other members of the public."[106]

The dissenting Justices in *Greenwood* considered the local laws to be relevant to the question of privacy expectations. They objected to a holding where, compelled by a government ordinance to dispose of garbage in this manner, people forfeit all reasonable expectations of

> The Court concludes, nevertheless, that [the officer] could use an airplane—a product of modern technology—to intrude visually into respondent's yard. The Court argues that respondent had no reasonable expectation of privacy from aerial observation.

Id.

102. *Id.* at 223-24.

103. 486 U.S. 35 (1988).

104. The *Greenwood* Court defined the issue before the Court as "whether the Fourth Amendment prohibits the *warrantless search and seizure* of garbage left for collection outside the curtilage of a home." *Id.* at 37 (emphasis added).

105. The California Supreme Court had denied a petition for review. *Id.* at 39.

106. *Id.* at 40 (footnotes omitted). Thus, because of "common knowledge" regarding accessibility, the Court holds the Fourth Amendment does not apply. By its own language, the Court acknowledges that the government performed a "warrantless search." *Id.* at 37. Normally, this should be enough to trigger the Fourth Amendment inquiry that follows the threshold test: whether the government's conduct was reasonable. Yet, the Court instead focuses entirely upon whether the individual's expectations were reasonable, and deciding that they were not, holds the Fourth Amendment inapplicable.

privacy.[107] These Justices also noted that many municipalities make it unlawful for anyone to move or otherwise interfere with articles left on a public street for collection.[108] Furthermore, the state superior court had held that the warrantless search of garbage violated its state constitution. Nonetheless, the majority did not believe that the local ordinances or state constitution indicated that society was prepared to consider the individual's privacy expectation reasonable.[109]

Paradoxically, eight months after *Greenwood*, the plurality in *Florida v. Riley*[110] found the legality of government conduct was central to its Fourth Amendment threshold analysis. The government, looking for marijuana, and without probable cause, flew a helicopter at 400 feet to peer through openings in the roof and walls of an individual's private greenhouse. The Court recognized that in contrast to the plane in *Ciraolo*, the public may not often travel in low flying helicopters over residential property. However, the plurality held that the

107. "Greenwood can hardly be faulted for leaving trash on his curb when a county ordinance commanded him to do so, . . . and prohibited him from disposing of it in any other way . . . ." *Id.* at 54-55 (Brennan, J., dissenting) (citations omitted).

108. *Id.* at 52-55. The dissent also noted that the majority had properly rejected the State's attempt to distinguish garbage on a theory of abandonment. *Id.* at 51. *But cf.* Jon E. Lemole, Note, *From* Katz *to* Greenwood*: Abandonment Gets Recycled from the Trash Pile—Can Our Garbage Be Saved from the Court's Rummaging Hands?*, 41 CASE W. RES. L. REV. 581 (1991) (arguing that the Court's reasoning represented a classic abandonment analysis).

109. The dissent noted that garbage contains intimate details about the lives of the people.

> "[A]lmost every human activity ultimately manifests itself in waste products . . . ." Smith v. State, 510 P. 2d 793, 798 (Alaska), cert. denied, 414 U.S. 1086 (1973). See California v. Rooney, 483 U.S. 307, 320-321, n. 3 (1987) (WHITE, J., dissenting) (renowned archaeologist Emil Haury once said, "[i]f you want to know what is really going on in a community, look at its garbage") (quoted by W. Rathje, Archaeological Ethnography . . . Because Sometimes It Is Better to Give Than to Receive, in Explorations in Ethnoarchaeology 49, 54 (R. Gould ed. 1978)); Weberman, The Art of Garbage Analysis: You Are What You Throw Away, 76 Esquire 113 (1971) (analyzing trash of various celebrities and drawing conclusions about their private lives). A single bag of trash testifies eloquently to the eating, reading, and recreational habits of the person who produced it. . . .

Greenwood, 486 U.S. at 50 (Brennan, J. dissenting).

The Court concluded that "snoops" defeat an expectation of privacy by making sole reference to the incident where a tabloid reporter examined Henry Kissinger's garbage and published the findings. *Id.* at 41 n.4. The dissent found that this incident supported a contrary conclusion:

> In evaluating the reasonableness of Greenwood's expectation that his sealed trash bags would not be invaded, the Court has held that we must look to "understandings that are recognized and permitted by society." . . . [However,] Kissinger was "really revolted" by the intrusion and his wife suffered "grave anguish." N. Y. Times, July 9, 1975, p. A1, col. 8. The public response roundly condemning the reporter demonstrates that society not only recognized those reactions as reasonable, but shared them as well. Commentators variously characterized his conduct as "a disgusting invasion of personal privacy," Flieger, Investigative Trash, U.S. News & World Report, July 28, 1975, p. 72 (editor's page); "indefensible . . . as civilized behavior," Washington Post, July 10, 1975, p. A18, col. 1 (editorial); and contrary to "the way decent people behave in relation to each other." ibid.

Id. at 51-52

110. 488 U.S. 445 (1989) (plurality opinion).

unlikelihood of public observation from such a low altitude was not dispositive of the Fourth Amendment search inquiry.[111]

Instead, the plurality said, "[i]t is of obvious importance that the helicopter . . . was not violating the law"[112] respecting legally navigable airspace. It expounded as a general proposition that "the police may see what may be seen from a public vantage point where [they have] a right to be."[113] In dissent, three Justices observed that the plurality's "exceedingly grudging Fourth Amendment theory" now allows an expectation of privacy to be defeated if a single member of the public could conceivably see into the area legally.[114]

The *Riley* plurality also introduced new factors into the threshold analysis. It noted that "no intimate details connected with the use of the home or curtilage were observed, and there was no undue noise, and no wind, dust, or threat of injury."[115] The Court held that, under these circumstances, there was no violation of the Fourth Amendment.[116]

The *Riley* dissenters raised questions about these new factors, which to date remain unanswered by the Court. They questioned what the plurality meant by its reference to "intimate details," calling this the "most remarkable passage in the plurality opinion."[117] They asked, "Where in the Fourth Amendment or in our cases is there any warrant for imposing a requirement that the activity observed must be 'intimate' in order to be protected by the Constitution?"[118]

111. *Id.* at 450-51. In a concurring opinion, Justice O'Connor disagreed with this conclusion. "[T]he relevant inquiry . . . is not whether the helicopter was where it had a right to be under FAA regulations." *Id.* at 454 (O'Connor, J., concurring). Instead, the inquiry is whether the helicopter was where "members of the public travel with sufficient regularity that Riley's expectation of privacy from aerial observation was not . . . 'reasonable.'" *Id.*

Justice O'Connor concurred with the plurality opinion because there was "reason to believe that there [was] considerable use of the airspace . . . and because [the defendant] introduced no evidence to the contrary." *Id.* at 455. In her view, the defendant had the burden of proving that an expectation of privacy was reasonable. *Id.*

See David J. Stewart, Florida v. Riley*: The Emerging Standard for Aerial Surveillance of the Curtilage*, 43 VAND. L. REV. 275 (1990) (discussing the view that the "frequency" of aerial flight serves as a gauge for measuring the reasonableness of privacy expectations from aerial observation).

112. *Riley*, 488 U.S. at 451-52.

113. *Id.* at 449 (citation omitted).

114. *Id.* at 457 (Brennan, J., dissenting).

115. *Riley*, 488 U.S. at 452.

116. *Id.*

117. *Id.* at 463 (Brennan, J., dissenting). "If the police had observed Riley embracing his wife in the backyard greenhouse, would we then say that his reasonable expectation of privacy had been infringed?" *Id.*

118. *Id.* Put another way, would the Court now hold that Fourth Amendment rights will be protected only where a citizen has evidence that a search revealed intimate information?

The dissenters also found it puzzling that the plurality should find noise, wind, and dust as measures for Fourth Amendment violations.[119] Such factors did not seem relevant where "'[t]he basic purpose of . . . [the Fourth] Amendment, as recognized in countless decisions of this Court, is to safeguard the privacy and security of individuals against arbitrary invasions by governmental officials.'"[120]

2. Accessibility and the Risk of Sense-Enhanced Observation

The underlying question in the lower courts' FLIR cases is whether the Fourth Amendment is implicated when this sense-enhancing device, operated entirely beyond the curtilage of private buildings, is used to access information regarding activities within those buildings. Yet, the Supreme Court has not settled how, or to what extent, sense-enhanced investigatory methods affect the modern Fourth Amendment threshold analysis.[121]

The *Ciraolo* Court mentioned that the government agents inspected only what they could see with the "naked eye."[122] However, it is not clear how important this factor was in the Court's analysis. In *United States v. Place*,[123] the Court stated in dicta that government agents may supplement their senses, without constituting a Fourth Amendment search, by using a narcotics detection dog to detect the concealed contents of an individual's container.[124] The Court stated that this limited disclosure "ensures that the owner of the property is not subjected to the embarrassment and inconvenience entailed in less discriminate and more intrusive investigative methods."[125] However,

119. *Id.* at 462. Noting that the FAA does not impose a minimum altitude requirement for helicopters, the Justices questioned whether the plurality would apply the same reasoning to governmental use of a silent, non-disruptive, low-flying helicopter to discover what the individuals were reading or who their guests were, or to peer into a room of the house viewable only from the air. *Id.* at 462-63.

120. *Id.* (quoting Camara v. Municipal Court, 387 U.S. 523, 528 (1967).

121. *See generally* David E. Steinberg, *Making Sense of Sense-Enhanced Searches*, 74 MINN. L. REV. 563 (1990).

122. *Ciraolo*, 476 U.S. at 213. "The observations by [the officers] took place within public navigable airspace. . . . [F]rom this point they were able to observe plants readily discernible to the naked eye as marijuana." *Id.*

123. 462 U.S. 696 (1983).

124. The analysis of the canine sniff was unnecessary to the Court's decision, since the defendant did not contest its validity. *Id.* at 719 (Brennan, J., concurring) (citing United States v. Place, 498 F.Supp. 1217, 1228 (E.D.N.Y. 1980)).

125. *Place*, 462 U.S. at 707. The defendant probably finds little solace in being spared this embarrassment and inconvenience. There was no probable cause for a search in this case. *Id.* at 706. Without probable cause, the defendant had Fourth Amendment protection against "less discriminate and more intrusive investigative methods."

Also, an individual subjected to a canine sniff may find it more intrusive than other investigative methods. *See* Loewy *supra* note 11, at 1246-47. "[T]he very act of being subjected to a

the Court has not articulated whether or how this principle may apply to other sense-enhanced surveillance techniques.

In *Dow Chemical Co. v. United States*,[126] the Court held that there was no Fourth Amendment search when the Environmental Protection Agency (EPA) used sense-enhanced technology to investigate a 2,000-acre commercial chemical facility. The EPA used a standard precision aerial mapping camera to photograph the facility from altitudes of 12,000, 3,000, and 1,200 feet.[127] The camera was valued at more than $20,000 and the photographs revealed details 1/2 inch in diameter.[128]

The *Dow Chemical* Court stated that the photographs "undoubtedly give EPA more detailed information than naked-eye views."[129] However, "[t]he mere fact that human vision is enhanced somewhat . . . does not give rise to constitutional problems."[130] The Court reasoned, in part, that the photographs only revealed the outline of the facility's buildings and equipment and did not show intimate details that would raise constitutional concerns.[131] "An electronic device to penetrate walls or windows so as to hear and record confidential discussions of chemical formulae or other trade secrets would raise very different and far more serious questions."[132]

The Court also found it significant that the government had used a "conventional, albeit precise, commercial camera" rather than a "unique sensory device."[133] The Court did not explain the signifi-

body sniff by a German Shepard may be offensive at best or harrowing at worst to the innocent sniffee." *Id.*

126. 476 U.S. 227 (1986) (decided the same day as California v. Ciraolo, 476 U.S. 207 (1986)).

127. *Id.* at 229.

128. *Id.* at 243, 243 n.4 (Powell, J., concurring in part and dissenting in part).

129. *Id.* at 238.

130. *Id.*

131. *Id.* at 238. Although power lines as small 1/2 inch in diameter where observed, "those power lines are observable only because of their stark contrast with the snow-white background." *Id.* at 239 n.5. No other small objects, "such as a class ring, for example, are recognizable, nor are there any identifiable human faces or secret documents captured in such a fashion as to implicate more serious privacy concerns. Fourth Amendment cases must be decided on the facts of each case, not by extravagant generalizations." *Id.* "'[W]e have never held that potential, as opposed to actual, invasions of privacy constitute searches for purposes of the Fourth Amendment.'" *Id.* (quoting United States v. Karo, 468 U.S. 705, 712 (1984).

132. *Id.* at 239. Although the device used by the government did not capture confidential discussions, Dow claimed that photographs, which show the design and configuration of Dow's equipment, reveal details of secret manufacturing processes. *Id.* at 240. (Powell, J., concurring in part and dissenting in part).

133. *Dow Chemical*, 476 U.S. at 238. In their partial dissenting opinion, four Justices argued that this analysis contradicted *Katz* and threatened future privacy rights in the wake of increasingly available technology.

> [A]s the Court states, the surveillance was accomplished by using 'a conventional, albeit precise, commercial camera commonly used in map-making.' These observations

cance. However, it can be inferred that legitimate expectations of privacy may be diminished where the government employs a device that is generally available to the public. Thus, the Court stated in dicta, "It may well be, as the government concedes, that surveillance of private property by using highly sophisticated surveillance equipment not generally available to the public, such as satellite technology, might be constitutionally proscribed absent a warrant."[134]

The decision in *Dow Chemical*, however, does not dispose of the question of whether the government could use similar sense-enhancing technology to inspect a private home and curtilage without implicating the Fourth Amendment. The Court found that Dow's vast industrial complex was more comparable to an "open field"[135] than the curtilage of a residence. The Court said, "We find it important that [the Dow facility] is not an area immediately adjacent to a private home, where privacy expectations are most heightened."[136]

In *United States v. Knotts*,[137] the Court found there was no Fourth Amendment search when government agents enhanced their senses by attaching a "beeper"[138] to an object, and remotely monitored the

> shed no light on the antecedent question whether Dow had a reasonable expectation of privacy. Katz measures Fourth Amendment rights by reference to the privacy interests that a free society recognizes as reasonable, not by reference to the method of surveillance used in the particular case. If the Court's observations were to become the basis of a new Fourth Amendment standard that would replace the rule in Katz, privacy rights would be seriously at risk as technological advances become generally disseminated and available in our society.

Id. at 251 (citations omitted) (Powell, J., dissenting in part and concurring in part).

134. *Id.* at 238.

135. *Id.* at 235-37. Fourth Amendment protections regarding the curtilage surrounding a home do not extend to open areas beyond the curtilage. The Court's "open fields" doctrine states that "an individual may not legitimately demand privacy for activities out of doors in fields, except in the area immediately surrounding the home." *Id.* at 235-36 (quoting Oliver v. United States, 466 U.S. 170, 178 (1984)).

136. *Id.* at 237 n.4. Four Justices, dissenting in part, recognized that the offensiveness "of the general warrant and writ of assistance, so despised by the Framers of the Constitution, 'was acutely felt by the merchants and businessmen whose premises and products were inspected' under their authority." *Id.* at 245 (Powell, J., concurring in part and dissenting in part) (quoting Marshall v. Barlow's, Inc., 436 U.S. 307, 311 (1978)). "Against that history, 'it is untenable that the ban on warrantless searches was not intended to shield places of business as well as of residence.'" *Id.* (quoting *Marshall*, 436 U.S. at 312).

The dissenting justices noted that the Dow Chemical Company appeared to have done everything feasible to protect its confidential business information. During each of the ten years preceding the litigation, the company spent at least $3,250,000 on security for the facility. This included procedures against aerial surveillance. Regularly, Dow watched for suspicious overflights, worked with the State Police and local airports to identify pilots who may have photographed the facility, and through requests and litigation, retrieved any photographs actually taken. *Id.* at 241-42.

137. 460 U.S. 276 (1983).

138. A beeper is a radio transmitter that emits signals that can be monitored by a radio receiver. *Id.* at 277.

object while it was transported in a vehicle. "Nothing in the Fourth Amendment prohibit[s] the police from augmenting the sensory faculties bestowed upon them at birth with such enhancement as science and technology afforded them in this case."[139] However, the Court stressed that, since the vehicle could have also been tracked by visual surveillance, "scientific enhancement of this sort raises no constitutional issues which visual surveillance would not also raise."[140]

Accordingly, in *United States v. Karo*,[141] the Court held that the government had conducted a search when its agents remotely monitored a beeper, attached to an object, while it was located, out of sight, within houses.[142] The court stated that private residences are places in which Fourth Amendment protections normally apply, and this protection extends to where "the Government surreptitiously employs an electronic device to obtain information that it could not have obtained by observation from outside the curtilage of the house."[143] However, this does not resolve whether the government agents may enhance their senses from beyond the curtilage to observe the contents of the home.[144]

3. Expanding Access, Expanding Risks

Applying the modern Court's threshold analysis, many lower courts have expanded the classes of government surveillance techniques that fall outside the Fourth Amendment search threshold.[145] For example, lower courts have held that the government may listen

139. *Id.* at 282. The Court cited United States v. Lee, 274 U.S. 559, 563 (1927), which held that using a searchlight to augment the senses did not constitute a Fourth Amendment search. *Knotts*, 460 U.S. at 282-83.

Three Justices did not join in the Court's opinion because of the majority's "unnecessarily broad dicta . . . [which] may prove confusing to courts that must apply this decision in the future." *Knotts*, 460 U.S. at 288 (Stevens, J., concurring). "Although the augmentation in this case was unobjectionable, it by no means follows that the use of electronic detection techniques does not implicate especially sensitive concerns." *Id.*

140. *Knotts*, 460 U.S. at 285.

141. 468 U.S. 705 (1984).

142. Although the government used its observation in a warrant affidavit, the Court held that this did not invalidate the warrant. *Id.* at 721. There was other information which was sufficiently untainted to provide probable cause to support the warrant. *Id.*

143. *Id.* at 715. It is "less intrusive than a full-scale search, but it does reveal a critical fact about the interior of the premises that the Government is extremely interested in knowing and that it could not have otherwise obtained without a warrant." *Id.*

144. For an in-depth analysis and comparison of *Knotts* and *Karo*, see Clifford S. Fishman, *Electronic Tracking Devices and the Fourth Amendment:* Knotts, Karo, *and the Questions Still Unanswered*, 34 CATH. U. L. REV. 277 (1985).

145. For an overview of lower court decisions regarding sense-enhanced searches accomplished with telescopes, binoculars, and fluorescent powder, see Steinberg, *supra* note 121, at 605-12. "The lack of guidance provided by the[ ] [Supreme] Court opinions has . . . generated conclusory and conflicting lower court decisions." *Id.* at 612.

to personal telephone calls made with cordless phones, even when neither party to the conversation has consented to the surveillance.[146] Despite the factual similarity to *Katz*, these decisions reason that people should know that cordless phone technology is easily intercepted, beyond the curtilage, by private third parties. Thus, people who use cordless telephones voluntarily assume the risk of exposing their communications to government surveillance.[147]

Expanding upon the holding in *Greenwood*, one circuit court recently held that the IRS did not violate a reasonable expectation of privacy when it systematically pieced together shredded documents that an individual left outside his home for trash removal.[148] The court characterized the circumstances as "a failed attempt at secrecy by reason of underestimation of police resourcefulness," and stated that "[t]here is no constitutional protection from police scrutiny as to information received from a failed attempt at secrecy."[149] This statement illustrates how far Fourth Amendment jurisprudence has diverged from the holdings and spirit expressed in *Boyd* and *Katz*.

Jurisprudence that holds that the Constitution does not apply to "failed attempt[s] at secrecy" is especially alarming in the "Information Age."[150] Precious little information is, or can be, entirely concealed. Increasingly, the computer and natural sciences make it possible to gain access to and derive information from what were previously unintelligible or non-existent sources.[151] Perhaps nowhere is

146. *See, e.g.*, United States v. Smith, 978 F.2d 171 (5th Cir. 1992), *cert. denied*, 113 S. Ct. 1620 (1993); Tyler v. Berodt, 877 F.2d 705 (8th Cir. 1989), *cert. denied*, 493 U.S. 1022 (1990); United States v. Carr, 805 F. Supp. 1266 (E.D.N.C. 1992).

147. *See, e.g., Carr*, 805 F. Supp. at 1276. The court analogized the use of a cordless phone, which emanates radio waves outside the home, to a shout, which can be overheard by outsiders. *Id.* It also stated, "[T]he Government did not plant a bug or beeper inside the [defendant's] apartment; it did nothing to cause information about the goings-on inside the apartment to be transmitted outside the apartment. Rather it passively (albeit intentionally) received information being broadcast to anyone within range who was utilizing compatible equipment." *Id.* This is remarkably reminiscent of the *Olmstead* reasoning which was later discredited by *Katz*. *See supra* notes 57-58 and accompanying text.

148. United States v. Scott, 975 F.2d 927 (1st Cir. 1992), *cert. denied*, 113 S.Ct. 1877 (1993).

149. *Id.* at 930.

150. *See generally* Francis S. Chlapowski, Note, *The Constitutional Protection of Informational Privacy*, 71 B.U. L. REV. 133 (1991) (discussing the proliferation of personal information in the private and public sectors, and the need to recognize a constitutional right to informational privacy).

151. More than twenty years ago, Arthur Miller wrote that "there are precious few things left in life that will not leave distinctive electronic tracks in the memory of the computer—tracks that can tell a great deal about our activities, habits, and associations." MILLER, *supra* note 86, at 54; *see generally* Charles Piller, *Privacy in Peril; How Computers Are Making Private Life a Thing of the Past*, THE RECORDER, July 19, 1993, (Commentary; Technology and the Law), *available in* LEXIS, Nexis NEWS Library, RECRDR File, at *6. The article quotes Gary Marx, a privacy expert at the University of Colorado:

this trend more evident than in the emerging capabilities and extensive use of remote sensing systems.[152] Operating from remote locations, these systems derive, record, and analyze meaningful information from the otherwise imperceptible energies given off by all substances.[153]

III. THE NEED TO REORIENT THE FOURTH AMENDMENT THRESHOLD ANALYSIS

A. The Misapplication of Katz: Measuring Expectations With a Shifting Gauge

The modern Court's Fourth Amendment threshold analysis has not produced a coherent or effective approach to "protecting people, [rather than] places"[154] from advancing surveillance techniques.[155] The Court continues to cite *Katz* as the foundation for its analysis. However, the modern analysis is antithetical to *Katz*. Despite rhetoric to the contrary, the Court generally finds that government agents may intrude upon the private lives of Americans, so long as they do so without making non-consensual physical intrusions.[156] Contrary to the promise of *Katz*, the Court is essentially surrendering constitutional protections to modern science and invention.

The modern Court misapplies *Katz*. Within the context of this Fourth Amendment analysis, expectations of privacy cannot be measured without gauging the expectations with the Constitution itself. Constitutionally protected expectations must reflect the values inherent in our system of government and guaranteed through constitu-

> As technology becomes ever more penetrating and intrusive, it becomes possible to gather information with laserlike specificity and spongelike absorbency . . . . Information leakage becomes rampant; indeed, it is hemorrhaging. Barriers and boundaries—be they distance, darkness, time, walls, windows, even skin—that have been fundamental to our conceptions of privacy, liberty and individuality give way. Actions, feelings, thoughts, acts, even futures are increasingly visible.

Id. at *1.

152. *See e.g. supra* note 86.

153. *See supra* notes 23-43 and accompanying text.

154. *See supra* text accompanying note 70.

155. Most commentators have recognized that the Fourth Amendment doctrine is "in a state of theoretical chaos that belies its supposed objective legitamation of governmental intrusions into our 'private affairs.'" Donald R. C. Pongrace, *A Symposium of Critical Legal Study: Stereotypification of the Fourth Amendment's Public/Private Distinction: An Opportunity for Clarity*, 34 AM. U. L. REV. 1191, 1208 (1985).

156. "It is axiomatic that the Court in *Katz* freed the Fourth Amendment from the narrow confines of property law. Fishman, *supra* note 144, at 306 n.117. But *Katz* is the only case in which the Court has held that a search or seizure occurred without a physical seizure of or intrusion into, a suspect's person or property. *Id.*

tional constraints.[157] Thus, the *Smith* Court noted, "[W]here an individual's subjective expectations had been 'conditioned' by influences alien to well-recognized Fourth Amendment freedoms, those subjective expectations *obviously* could play no meaningful role in ascertaining what the scope of Fourth Amendment protection was."[158]

However, the modern Court instead gauges "reasonable" expectations of privacy with the frustrations of privacy borne in the private sector of society. Furthermore, the Court's gauge is set to those frustrations that are suffered because of invasive conduct which is obtrusive and, in some cases, illegal and tortious.[159]

Generally, the Court holds that personal information or objects that may be accessible to the public at large, or may be accessible to a third party in particular, lay beyond the threshold of the Fourth Amendment.[160] The Court has not made exceptions where individuals cannot prevent or control this access, or where the access is accomplished by violations of local law. The result is that compelled frustrations of privacy among individuals destroy constitutional limits on government conduct.

In some opinions, privacy expectations have been gauged in relation to the likelihood of observation by non-government individuals or organizations. Thus, privacy expectations may be diminished where, for example, aerial observations are carried out from well-travelled airspace,[161] or accomplished with commonly available or inexpensive observation equipment.[162] However, in modern times, the likelihood that private parties will use a particular technology increases constantly and rapidly. Public availability of technology, whether measured according to the frequency of commercial use

157. *See supra* text accompanying notes 84-86.

158. Smith v. Maryland, 442 U.S. 735, 741 n.5 (1979) (emphasis added).

159. *See generally* Michael Campbell, Comment, *Defining a Fourth Amendment Search: A Critique of the Supreme Court's Post-Katz Jurisprudence*, 61 WASH. L. REV. 191 (1986). The author proposes that the Court should instead gauge Fourth Amendment expectations of privacy with generally accepted social norms of privacy among citizens. *Id.* at 194.

160. *See, e.g.*, Lewis R. Katz, *In Search of a Fourth Amendment for the Twenty-First Century*, 65 IND. L.J. 549, 564 (1990). The modern Court has transformed *Katz's* "knowing exposure" rationale into "a roadblock to fourth amendment protection instead of a roadmap for ensuring it." *Id.* Each limited disclosure of information results in the complete loss of protection in that information. *Id.*

161. *See supra* note 111; *see also* Stewart, *supra* note 111, at 291-92.

162. *See supra* notes 133-34 and accompanying text; *cf. supra* note 106 and accompanying text (discussing *Greenwood*'s "common knowledge" analysis).

or according to the purchase price, provides a highly transient measure.[163]

In the Information Age, the people's ability to secure their privacy is quickly becoming less determined by subjective intentions and societal values, and more controlled by the use of emerging technologies.[164] A Fourth Amendment analysis that stops short at the threshold, where individuals fail to control the uncontrollable exposure of personal information, affords no protection to the citizens of a technologically advanced nation.[165]

Thus, ironically, as the people become less able to personally secure their own privacy interests from violations, they concurrently lose constitutional protection to secure them against such violations. If the progress of science and the Court's analysis are taken to their ultimate, logical conclusion, the Fourth Amendment could be virtually reduced to a quaint remnant of early American society and political theory.[166]

163. *See, e.g., supra* note 133; *see also* Washington v. Young, 867 P.2d 593, 598 (Wash. 1994). The *Young* court stated:

> We believe our legal right to privacy should reflect thoughtful and purposeful choices rather than simply mirror the current state of the commercial technology industry. At the same time, a privacy right that is defined by a particular level of technological sophistication is administratively unworkable. Governmental agents could not be certain at what point a warrant is required.

Id.

164. *See, e.g.,* Piller *supra* note 151.

> The public views these developments with growing alarm. In a 1992 poll conducted by Louis Harris and Associates, 78 percent of Americans expressed concern about their personal privacy, up from about a third of those polled in 1970, and up from 64 percent in 1978. Perceived threats to personal privacy from computers rose from 38 percent in 1974 to 68 percent last year.
>
> In a 1991 Time/CNN poll, 93 percent of respondents asserted that companies that sell personal data should be required to ask permission from individuals in advance. The 1990 census showed the highest rates of non-cooperation ever—the result of fears that participation could place personal information in jeopardy, contend some privacy advocates. And California's Privacy Rights Clearinghouse—the first privacy hotline in the nation—logged more than 5,400 calls within three months of its inception last November.

Id. at *1-2.

165. *See, e.g.,* Katz, *supra* note 160, at 573-75. "[I]n the end we will transform the nation . . . into a society where . . . [individual] freedoms are as fragile as the official self-restraint upon which their continued existence now totally depends." *Id.* at 575.

166. *See supra* note 133; *see also* Gutterman, *supra* note 4, at 720. "The Court has become embroiled in a semantic mesh of its own choosing by departing from 'the spirit as well as the letter of the Fourth Amendment,' and such departure may well 'sweep all our traditions into the fire.'" *Id.* (quoting Federal Trade Comm'n v. American Tobacco Co. 264 U.S. 298, 305-06 (1924)).

> The Court should 'reject the Orwellian notion that precious liberties derived from the Framers simply shrink as the government acquires new means of infringing them.' In our times of ever-increasing and potentially unlimited technology, the judiciary must make the government aware that it does not possess carte blanche authority to keep

B. *Remote Sensing and the Shifting Gauge*

In *Dow Chemical*, the Court suggested that government use of highly sophisticated surveillance equipment, such as satellite technology, which is not generally available to the public, might constitute a "search" and thus require a warrant. However, to conclude that the Fourth Amendment protects the people from unwarranted satellite surveillance, the Court will not be able to rely on the continuously shifting gauge of public availability.

Some satellite remote sensing technology is already being used for private commercial purposes.[167] And in March 1994, the Clinton Administration announced a new policy that would ease marketing restrictions on United States' espionage satellite imaging technology.[168] This policy would enable United States' businesses to build and operate the technology, and market it to commercial and government customers worldwide.[169]

The Administration's policy includes provisions to ensure that the government maintains the capability to access information from satellite imaging jobs. The policy would require customers to maintain records of the job instructions carried out by the satellite.[170] It would also forbid the use of encryption devices that are capable of undermining government access to the satellite data.[171] Such devices are standard security controls that employ encryption techniques to prevent unauthorized access to information.[172]

> watch over its citizens or their businesses. To remove the judiciary as a restraining influence in this process is totally unwise.

Id. at 720-21 (quoting People v. Cook, 710 P.2d 299, 305 (Ca. 1985)).

167. *See, e.g,* Peter Bond, *All the Better to See You With; Somewhere Up There, Something is Watching . . . Peter Bond Looks at the Explosion of Flying Eyes*, THE INDEPENDENT, Sept. 20, 1993, (Science Page), *available in* LEXIS, Nexis NEWS Library, INDPNT File, at *15. The commercial market for satellites and satellite data grew about 20 percent a year during the previous three years. *Id.* at *1. "By the time the multinational Earth Observing System is deployed after 1998, when remote sensing satellites will be sending back the equivalent of 20 million 500-page books each week, the term 'invasion of privacy' will take on a whole new meaning." *Id.* at *3.

168. *See, e.g.,* Andrews, *supra* note 29.

169. *Id.*; *see also U.S. Sets New Policy to Expand Exports of Remote Sensing Technology*, BNA WASH. INSIDER, Mar. 11, 1994, Export Controls, *available in* LEXIS, Nexis BNA Library, BNAWI File. Remote sensing from space provides military, civil governmental, scientific, industrial, and individual users with the ability to gather data for various purposes. *Id.* at *1. "The U.S. government operates extremely high-resolution space-based reconnaissance systems for intelligence gathering and military purposes, and many other countries have now discovered the value of these satellites and are developing their own capabilities or are seeking to purchase data or systems from foreign countries . . . ." *Id.* at *2.

170. Andrews, *supra* note 29, at C5.

171. *Id.*

172. *See generally Communications, Administration's Encryption Initiative Not Welcomed By Industry*, BNA DAILY REP. FOR EXECUTIVES, Aug. 16, 1993, (Analysis and Reports), *available in*

In sum, the Administration's policy removes many restraints that once limited private access to satellite information, while also ensuring that government law enforcement agents will not face technological security barriers for accessing the privately developed information. Thus, only legal constraints will be able to restrain government access. It may not be long before the courts are asked to decide whether the private availability of satellite data determines the people's reasonable expectations with regard to government inspections of that data.

In the meantime, the lower courts are considering whether the Fourth Amendment protects the people from aerial and ground-based remote sensing surveillance, accomplished with thermal infrared imaging systems, to inspect privately owned buildings.[173] Like satellite technology, FLIR technology is widely used for commercial and government applications, and its technological development and usage is rapidly escalating.[174]

LEXIS, Nexis NEWS Library, DREXEC File. Encryption devices are widely used by companies in financial, insurance, and other industries for secure electronic data transfer. *Id.* at *1. In April 1993, the Clinton Administration announced the "Clipper Chip" telecommunications initiative which would create a new standard for encryption, using a microprocessor developed by the National Security Agency and the National Institute of Standards and Technology. *Id.*; *see also* Mary E. Thufault et al., *The Data Security Furor*, INFO. WK., Feb. 14, 1994, at 12. This article describes the heated debate over the Clinton Administration's proposed "Clipper Chip" standard, which can scramble the electronic transmission of a conversation or document so that "it can be deciphered only by the intended recipient—and the government." *Id.* at 12. "Big Brother is watching, but he's not satisfied with the view." *Id.*

173. A holding that the FLIR inspection of a home does not implicate the Fourth Amendment may support a later holding that similar satellite technology is also permitted. Lisa Steele, Comment, *A View from on High: Satellite Remote Sensing Technology and the Fourth Amendment*, 6 HIGH TECH. L.J. 317, 318 (1991).

174. *See, e.g., FLIR Systems Reports Record Financial Results for 1993; Revenue Increases 23.2%; Net Income Up 47.2%*, PR NEWSWIRE, Feb. 10, 1994 (Financial News), *available in* LEXIS, Nexis NEWS Library, PRNEWS File. FLIR Systems, Inc. is a major FLIR-market participant that designs, manufactures, and markets thermal infrared imaging systems worldwide. *Id.* at *1.

> Night vision applications include public safety (law enforcement and drug interdiction; search and rescue; border and maritime patrol; and environmental protection) and defense (surveillance, reconnaissance, and navigation assistance). Industrial applications include predictive and preventive maintenance; non-destructive testing and evaluation; research and development; and manufacturing process control and monitoring.

Id. at *1-2.

FLIR Systems, Inc. reported that 1993 revenues from the sale of its industrial infrared imaging systems increased 36% from 1992, to $7.4 million. Revenues in 1993 from the sale of night vision systems and sensors increased 20.5% from 1992, to a record $31.0 million. *Id.* at *1; *see also* Stanley W. Kandebo, *Cypher Moves Toward Autonomous Flight*, 140 AVIATION WK. & SPACE TECH., Mar. 7, 1994, at 42. Sikorsky Aircraft is equipping its experimental unmanned aerial vehicle (UAV), named Cypher, with cameras, FLIRs, and other sensors. Cypher is a small donut-shaped UAV which is 6.5 feet in diameter, and uses a closed-rotor system. It can operate at an altitude up to 8,000 feet, and, because of its closed-rotor system, it has been flown in confined areas covered with trees and shrubs. *Id.* at 42, 44. The Cypher is being designed for both commercial and government applications. *Id.* at 42.

For example, FLIR technology will be augmented as part of the United States Defense Department's Advanced Research Projects Agency's (ARPA) Technology Reinvestment Project.[175] This project supports "dual use" technologies that link commercial industrial needs with defense needs.[176] As part of this project, ARPA has awarded a grant to a business-government consortium,[177] consisting of aerospace electronics companies, commercial airlines, and government agencies, to develop an Autonomous Landing Guidance (ALG) system for commercial and military aircraft.[178] The system will integrate Forward Looking Infrared Radar with millimeter-wave radar and information from the satellite-based Global Positioning System.[179]

C. *An Orwellian Vision*

The implication of advanced remote sensing systems, as well as computer-based surveillance methods in general are staggering, and difficult for the newly initiated to conceptualize. Thus, many writers and dissenting Justices have drawn upon descriptive passages from George Orwell's *1984* to articulate the frightening vision.[180] The capa-

175. *See, e.g., FLIR Systems Inc. Part of Team Awarded $42.0 Million Federal Grant for Development of Next-Generation Aircraft Landing System*, PR Newswire, March 2, 1994, (Financial News), *available in* LEXIS, Nexis NEWS Library, PRNEWS File.

176. *Id.* at *1.

177. The consortium is led by Lear Astronics Inc. of Santa Monica, Ca., and includes FLIR Systems Inc., Portland; United Airlines, Chicago; Northwest Airlines, Minneapolis; Interstate Electronics Inc., Anaheim, Ca.; Malibu Research Inc., Calabasas, Ca.; Norton Plastics Inc., Ravenna, Ohio; the U.S. Air Force Flight Dynamics Laboratory in Dayton, Ohio, and the Rome Air Development Laboratory in Rome, N.Y.; the U.S. Army Communications and Electronics Command in Ft. Monmouth, N.J.; NASA's Ames Research Center at Moffett Field, Ca., and Langley Research Center in Langley, Va.; and the University of Maryland's Advanced Development Laboratory in Greenbelt, Md. *Id.* at *1-2.

178. *Id.* at *1. This ALG system will "enable commercial and military pilots to conduct 'clear-day' flight operations, including taxi, take-off, and landing, during conditions of extremely low visibility, such as in inclement weather, dense fog, smoke or haze, or during combat situations." *Id.*

179. *Id.*

180. In his dissent in *Florida v. Riley*, Justice Brennan wrote:

> I hope it will be a matter of concern to my colleagues that the police surveillance methods they would sanction were among those described forty years ago in George Orwell's dread vision of life in the 1980's:
>
> "The black-mustachio'd face gazed down from every commanding corner. There was one on the house front immediately opposite. BIG BROTHER IS WATCHING YOU, the caption said .... In the far distance a helicopter skimmed down between the roofs, hovered for an instant like a bluebottle, and darted away again with a curving flight. It was the Police Patrol, snooping into people's windows."

488 U.S. 445, 466 (1989) (Brennan, J., dissenting) (quoting GEORGE ORWELL, NINETEEN EIGHTY-FOUR 4 (1949)). *See also* Gutterman, *supra* note 4, at 649, Katz, *supra* note 160, at 562, and Steele, *supra* note 173, at 1, all quoting from the following passage:

> There was of course no way of knowing whether you were being watched at any given moment .... It was even conceivable they watched everybody all the time .... You had

bility of integrated computer-based technology to quickly locate, identify, aggregate, correlate, interpret, and then project information is seemingly unlimited. However, the true extent of the government's capabilities are unknown because they are withheld from the public.[181] The technology continues to advance rapidly.[182] Regardless of what today's limitations may be, such limitations may represent only technological challenges that time and effort will overcome.

The development and uncontrolled use of such technology is exceptionally pertinent to the Fourth Amendment threshold analysis. There is a clear parallel to the arbitrary rummaging that government

> to live—did live, from habit that became instinct—in the assumption that every sound you made was overheard, and . . . every movement scrutinized.

ORWELL, *supra*, at 4.

181. *See, e.g.*, NEW TECHNOLOGIES, *supra* note 11, at 9-16.

> In the last two decades, advances in imaging technology, remote sensing, telecommunications, computers, and related technologies have greatly increased the capability for surveillance of people and their activities. Electronic surveillance includes both sensing techniques and techniques for aggregating and comparing computerized records to reveal additional information about an individual.

Id. at 12.

> Sensing techniques—involving sight and photography, sound and tapping or taping, and a variety of biological sensors—are increasingly powerful, able to operate at great distances, miniaturized and easy to conceal, and otherwise undetectable to the subject. In the form of data aggregation, storage, and processing systems, information technology allows local jurisdictions to cooperate, decreasing their dependence on national law enforcement agencies. But it also creates records that are persistent and widely shared, and difficult for the subject to know about, to access, to verify, or to correct.

Id. at 9.

The Offices of Technology Assessment, OTA, lists some of the electronic surveillance technologies used domestically, noting that the information was obtained in 1985 via a Federal Agency Data Request to all major components within the 13 cabinet-level agencies and to 20 independent federal agencies. *Id.* at 13 n.5. However, OTA further notes that this data request excluded the Defense Department's Defense Intelligence Agency and the National Security Administration because the results were to be unclassified. *Id.*; *see also* Holton, *supra* note 39. The market for photonic technologies "maintains a large measure of secrecy, which springs both from competition among companies and the desire of law enforcement agencies not to let the bad guys know what hit them." *Id.* at 53.

> Law enforcement agents are gluttons for data—the more and the faster, the better. As image-gathering capabilities have dramatically improved, the ability to manipulate and present the image data in a comprehensible form has also improved. The resulting value for law enforcement will only continue to improve if data gathered from multiple sources can be fused to create a coherent, in-depth picture of an area under surveillance. And this information must be rapidly transmitted to a command center.

Id. at 54-55.

As Donald Hutchinson, the director of sales and marketing for TAU Corporation, which are the developers of the prototype HAWK system, has noted: "Tactical reconnaissance will be very big in the 1990s. With sensors getting cheaper and smaller, the greatest expense is now in buying and operating the aircraft. As smaller, less expensive planes become available, tactical recon will be viable for more law enforcement agencies." *Id.* at 55. The Hawk system "essentially turns a small plane into a flying workstation that controls and exploits multiple imaging sensors." *Id.*

182. *See, e.g.*, General Sullivan Statement, *supra* note 30. "The pace of technological change has far outstripped the Cold War pace of weapons and equipment development." *Id.* at 171.

agents conducted throughout colonial homes.[183] The primary distinction between advanced surveillance and colonial intrusions is that the latter was comparatively primitive and inefficient, constrained by the severe limitations inherent in physical human capability.

In contrast, computer-based surveillance can be conducted by electronically casting the net wide, and allowing the technology to panoramically scan a great expanse, locating and continually monitoring the objects or information of interest. This is arguably more intrusive than physical rummaging because it can be performed without the subjects of investigation perceiving the electronic activity and without knowing what information is being discovered, recorded, and processed.[184]

It is stunning to think that such operations may not be labeled a "search" of the people and their property, and consequently, that the constitutional right to be secure from unreasonable searches provides no protection. If the Court so holds, the judiciary will not even reach the inquiry, which lays beyond the threshold question, of whether such operations are reasonable. The result would be that a warrant, authorizing a physical entry into a house, would effectively become only a warrant to seize—an inspection of the home would have been completed before the warrant was issued and the entry made.

D. Defining a Search

Understandably, the Court struggles with a difficult analysis when it seeks to formulate a Fourth Amendment "search" without referring to the easily recognizable physical attributes of more traditional search techniques. However, the Court faced the same challenge more than 100 years ago when it first analyzed the threshold in *Boyd*. *Boyd* held that the government could not skirt Fourth Amendment restrictions by simply changing the methods used to intrude upon the

183. *See, e.g.*, Steinberg, *supra* note 121, at 574-83. David Steinberg argues that sense-enhanced searches reveal broad and unfocused information contrary to the Fourth Amendment's particularity clause. *Id.* He recommends that sense-enhanced searches be subject to the warrant requirement, based on the balancing of three factors: 1) the specificity of the information revealed; 2) the limited duration of the search; and 3) the extent to which the search requires focus on a particular individual. *Id.* at 613.

184. *See, e.g., id.* at 569-74. The secrecy of the search chills free expression because law-abiding citizens may constantly fear government surveillance. *Id.* at 570-71. It also encourages improper police conduct because the individual and the community may never learn when searches occur. Thus, police may choose to engage in inappropriate sense-enhanced searches, where they would be forbidden to undertake a physical search. It is difficult for citizens to challenge such practices in criminal or civil court when they have no knowledge of when a search occurred, or what information was gathered. *Id.* at 571-74.

people's "indefeasible right of personal security, personal liberty and private property."[185] Thus, *Boyd* defined a Fourth Amendment search in terms of the "substance," "essence," and "substantial purpose" of the government's action.[186]

Besides looking to *Boyd* and *Katz*, the modern Court may find guidance in the common, contemporary applications of the term "search."[187] While science has advanced society's technological capabilities, our language has developed concurrently. In computerized applications, a "search" is an examination of a series of items for any that have a desired characteristic.[188] This definition is akin to the traditional searches that motivated the adoption of the Fourth Amendment. It is also particularly applicable since advanced surveillance techniques are generally computer-based.

The Court may find it instructive that, within the computer industry, computer-based searches are not defined according to what information the computer is capable of accessing. A computer may have—like government agents have had throughout the ages—the raw capability needed to gain access to virtually unlimited confidential information. However, computerized searches, in practice, are restrained

185. *See supra* text accompanying note 52.

186. *See supra* text accompanying note 52-53.

187. *See supra* note 17. Clark Cunningham has written an excellent linguistic analysis of the term "search." *See* Cunningham, *supra* note 17. He proposes a common sense approach to linguistic analyses of legal texts, and analyzes the meaning of "search" within this analytic framework. His approach begins with a semantic analysis of the senses that words have in everyday speech, before addressing the issues of competing authoritative interpretations. He argues "[i]f we cannot understand what an interpretation means, we can hardly debate its correctness." *Id.* at 542. "[M]ore fundamentally," he reminds us, "law that cannot be understood well enough to apply prospectively to order social action ceases to be law at all and becomes merely the ad hoc dictates of persons who occupy positions of authority at a particular point in time." *Id.*

> After the Court decided Smith in 1979 it appeared that the preliminary inquiry in most fourth amendment cases—whether the challenged action is a search—no longer depended on the meaning of any word, but on a rule of legitimacy that subsumed the entire analysis. Prosecutors, defendants, the lower judiciary, and, most important, the police were in a quandary. The post-Katz cases had failed to provide either semantic or policy guidance in applying this newly unfamiliar word: "search." Something was a search only if it infringed a legitimate privacy interest, and it seemed the only way to find out if an interest was legitimate was to obtain a ruling from the Supreme Court.

Id. at 582-83; *see also* Robert C. Power, *Criminal Law: Technology and the Fourth Amendment: A Proposed Formulation for Visual Searches*, 80 J. CRIM. L. & CRIMINOLOGY 1 (1989). "'[S]earches' should take its meaning from common sense and apply to those actions that in reality rummage through or about persons, houses, papers, or effects. The government therefore engages in a search whenever it examines a target's person or other protected place or thing." *Id.* at 60.

188. *See, e.g.*, CHARLES J. SIPPL, DICTIONARY OF DATA COMMUNICATIONS (2d ed. 1985). "[S]earch: To examine a series of items for any that have a desired property or properties." *Id.* at 439.

by security rules and procedures that limit actual access to only authorized searches.[189]

The modern computerized organization employs a security administrator who parallels the role of the court by insuring that any computer users are pre-authorized according to well established procedures.[190] Before any information may be accessed a legitimate purpose must be demonstrated and authorization granted. Any attempt to access any information not specifically authorized constitutes a security violation.

Like the Fourth Amendment's warrant requirement, this authorization restricts the circumstances under which a search is allowed and the specific information that may be accessed.[191] If the Court held that computer-based searches performed by the government were Fourth Amendment "searches," the warrant requirement would implement controls that parallel standard security practices used throughout computerized industries.

E. The Constitutional Issues

The Court must reorient its Fourth Amendment threshold analysis to the larger Constitutional principles and issues. In a free society, privacy expectations among individuals are not the same as privacy expectations between individuals and their government.[192] Constitu-

189. *See, e.g.*, Carl B. Jackson, *The Need for Security*, *in* 1 DATAPRO REPORTS ON INFORMATION SECURITY IS09-100-101 (Datapro Info. Serv. Group ed. Feb. 1994) (describing the historical development of computer security control practices, and the components of modern information security programs); *see also* Harry B. DeMaio, INFORMATION PROTECTION AND OTHER UNNATURAL ACTS (AMACOM 1992), *reprinted in Elements of Access Control*, *in* 3 DATAPRO REPORTS ON INFORMATION SECURITY IS50-100-101 (Datapro Info. Serv. Group ed. Feb. 1994).

190. *See* DeMaio, *supra* note 189. "The primary purpose of an information security program is to allow authorized persons and processes to do what they are supposed to do and to prevent everything else." *Id.* at 101.

191. *See id.*

> All access control mechanisms must do the same basic things. They must determine:
> 1. Who is authorized to access the system, information, or resources in question.
> 2. What they are authorized to do.
> 3. How they are authorized to do it.
> 4. What specific parts or aspects of the resource they can access.
> 5. Under what circumstances they can access them.
>
> Then the access control mechanism must control the person's or processes' activities accordingly.

Id. at 101-02.

192. "Fortunately, neither *Katz* nor the fourth amendment asks what we expect of government. They tell us what we should demand of government." Amsterdam, *supra* note 2, at 384. Consideration of "voluntary assumptions of risk is wildly besides the point. The fact that our ordinary social intercourse, uncontrolled by government, imposes certain risks upon us hardly

tional protections prohibit certain government activity in the private sector. In contrast, the same activity, including unreasonable searches, when performed by private citizens, may be either tolerated or restrained according to social customs and tort and criminal laws.[193] Privacy intrusions among individuals cannot constitutionally justify unjustifiable intrusions by the government.

The Court's analysis should focus on the actions of government agents, not the actions of private citizens.[194] The Fourth Amendment guarantees security from government searches that are unreasonable. New Fourth Amendment challenges continue to come before the courts because "[t]he progress of science in furnishing the Government with means of espionage . . . [did not] stop with wire-tapping."[195] Each case requires an analysis of the reasonableness of a government agent's actions, not of the reasonableness of an individual's claim to a "right to be let alone."[196] By focusing on the latter, the modern Court bypasses the former, central constitutional question.

The resulting loss of Fourth Amendment protection affects all members of American society—criminal suspects and non-suspects alike.[197] Each time the Court holds that the Fourth Amendment does

means that government is constitutionally unconstrained in adding to those risks." *Id.* at 406. Amsterdam wrote:

> [T]he authors of the Bill of Rights had known oppressive government . . . I believe they meant to erect every safeguard against it. . . [and] guarantee to their survivors the right to live as free from every interference of government agents as our condition would permit. . . . [I]t seems to me that the guarantee against unreasonable "searches and seizures" was written . . . to assure that any and every form of such interference is at least regulated by fundamental law so that it may be "restrained within proper bounds."

Id. at 400.

193. Ken Gormley distinguishes tort and Fourth Amendment privacy law. Gormley, *supra* note 44, at 1357-74. The function of tort law is to preserve individuality by controlling the flow of information about oneself. *Id.* at 1374. In comparison:

> [T]he Fourth Amendment species of privacy is designed to preserve "secrecy" or "sanctuary" or "solitude" vis-a-vis the government, allowing one to carry on one's activities in life—working, praying, interacting with family, owning property, reading, relaxing, thinking—without unjustified interference from the body politic. Such solitude was viewed as a core aspect of individual liberty at the time American democracy took shape. . . .

Id.

194. *See* Power, *supra* note 187. Power states that although *Katz* accurately identified the protection of privacy as the underlying policy of the Fourth Amendment, *Katz* erroneously assumed that it had to look at individual expectations of privacy in each case. "This resulted in judicial emphasis on the target and the disavowal of interest in the method of intrusion. But the fourth amendment makes a different choice—it prohibits unreasonable searches and seizures. . . . [T]he amendment itself regulates certain law enforcement techniques. Judicial emphasis should therefore be on police methods." *Id.* at 59.

195. Olmstead v. United States, 277 U.S. 438, 474 (Brandeis, J., dissenting).

196. *Id.* at 478; *see also supra* text accompanying note 61.

197. *See supra* notes 11-12 and accompanying text.

not apply because a defendant's expectation of privacy was not objectively reasonable, the American people concurrently and collectively lose an enforceable expectation of privacy from government intrusion.[198]

Meanwhile, modern life, and even the natural emissions of electromagnetic energy, increasingly forces exposure of the private lives of individuals. Unrestrained surveillance exploits this compelled exposure and places a heavy burden upon our society[199] that is incongruous with our political system.[200] In this age, more than ever,[201] it is essential that the Court heed Justice Bradley's statement regarding the judiciary's obligation to safeguard the American people: "It is the duty of courts to be watchful for the constitutional rights of the citizen, and against any stealthy encroachments thereon."[202]

IV. THE THERMAL IMAGING CASES

Since 1991, several courts have considered whether the government conducted a Fourth Amendment "search" when agents used thermal infrared systems to read and analyze the characteristics of home infrared emissions. This section reviews five of these cases.[203]

198. "[T]he principles which immunize government surveillance of a criminal's behavior from the fourth amendment's command also immunize that surveillance when it is directed at the citizen who has never committed a crime in his life." Katz, *supra* note 160, at 550; *see also* R. H. M., Note, *Tying Privacy in Knotts: Beeper Monitoring and Collective Fourth Amendment Rights*, 71 VA. L. REV. 297 (1985). The author argues that the Fourth Amendment analysis should assess the aggregate losses and negative effects that the people collectively suffer where unrestrained police surveillance, rather than privacy, becomes the expected norm. *Id.*

199. The Fourth Amendment cannot be interpreted to require Americans to withdraw into the recesses of their lives, as this would be contrary to our traditional commitment to an open society. Amsterdam, *supra* note 2, at 402. In 1974, Amsterdam wrote that, according his knowledge of the state of technology, "anyone can protect himself against surveillance by retiring to the cellar, cloaking all the windows with thick caulking, turning off the lights and remaining absolutely quiet." *Id.* In the 1990s, this may no longer be sufficient.

200. *See, e.g.*, Gutterman *supra* note 4. "The newly approved technological police techniques are 'abhorrent to the instincts of an American,' and are better suited to 'the purposes of despotic power' than to 'the pure atmosphere of political liberty and personal freedom.'" *Id.* at 721 (quoting Boyd v. United States, 116 U.S. 616, 632 (1886)). "The fine line between citizens and their government is the very boundary that separates our system from more repressive states. The totalitarian government depends on secrecy for the state, but intensive surveillance of its citizenry. The democratic society relies on publicity for its actions, and on privacy for its people." *Id.* at 705.

201. "'The U.S. is an embarrassment to the privacy movement overseas . . . . The U.S. stands alone as an example of what a superpower should not do in privacy.'" Piller, *supra* note 151 (quoting Simon Davies, director of the Australian Privacy Foundation). Regarding the Clinton Administrations multi-billion-dollar "data superhighway," the protection of personal information is the privacy issue of the twenty-first century, "yet so far the government has ignored the privacy implications of the project." *Id.* at *6.

202. Boyd v. United States, 116 U.S. 616, 635 (1886).

203. United States v. Ishmael, 843 F. Supp. 205 (E.D. Tex. 1994), *rev'd*, No. 94-40159, 1995 U.S. App. LEXIS 4957 (5th Cir. Mar. 15, 1995); United States v. Kyllo, 809 F. Supp. 787 (D. Or.

In each case, the systems were used to determine whether residents were using indoor grow lights to cultivate marijuana inside the enclosed buildings. Without warrants, the government used thermal imaging techniques in combination with other "non-search" methods, such as visual observation, reviewing the records of gardening and equipment supply retailers, analyzing utility company records of home power usage, and combing through household refuse.

A. Four Federal District Court FLIR Cases

1. Risking Surveillance by Generating Heat

United States v. Penny-Feeney[204] was the first district court case to consider the use of FLIRs within the Fourth Amendment context. On April 3, 1990, Hawaii County police officers conducted a physical search of the defendants' home, pursuant to a search warrant, and found an indoor marijuana growing operation. The probable cause supporting the search warrant was based in part on evidence gathered earlier that day with a FLIR system.[205]

At 5:15 a.m., two police officers, and a private pilot experienced in the use of FLIRs, flew over the defendants' home in a helicopter equipped with a FLIR system. The residence appeared dark to the naked eye. However, the FLIR's video monitor displayed bright white tones on the walls and areas of the garage. They also aimed the FLIR at other residences in the area and found that they appeared in a different color than the defendants' residence. The pilot concluded that the thermal infrared image of the defendants' residence was consistent with images of structures that employed artificial lighting to cultivate marijuana indoors.[206]

1992), *remanded for evidentiary hr'g*, 37 F.3d 526 (9th Cir. 1994); United States v. Deaner, No. Cr-92-0090-91, 1992 U.S. Dist. LEXIS 13046 (M.D. Pa. July 27, 1992), *aff'd on other grounds*, 1 F.3d 192 (3rd Cir. 1993); United States v. Penny-Feeney, 773 F. Supp. 220 (D. Haw. 1991), *aff'd on other grounds*, 984 F.2d 1053 (9th Cir. 1993); Washington v. Young, 867 P.2d 593 (Wash. 1994).

204. 773 F. Supp. at 220.

205. Other elements supporting the warrant included tips from informants and corroborating observations by a county officer. In addition, two years earlier, law enforcement officers observed one of the defendants picking up a package containing money. The officers had searched the package, pursuant to a warrant. A narcotics-trained dog gave a positive alert on the money. No charges were filed. *Id.* at 221-23.

206. The pilot had operated the device "15 to 20 times in the past for marijuana searches." *Id.* at 223.

Images from previous positive sightings, used as a model for future sightings, is reminiscent of the term, used in the natural sciences, "search-image." *See* CAMBRIDGE DICTIONARY OF SCIENCE AND TECHNOLOGY 794 (Peter M. B. Walker ed., 1988). Search-image, when used as a behavioral term, "[r]efers to the perceptual phenomena of an increased accuracy of discrimination for certain objects in the environment, e.g. a predator's improved ability to see camouflaged

The defendants moved to suppress the evidence, arguing that the government engaged in an illegal warrantless search when it subjected their home to a FLIR inspection. The court held that the government's warrantless use of the FLIR was not prohibited by the Fourth Amendment because it did not constitute a search. The court noted that the FLIR is a passive instrument that does not send beams or rays into the object of investigation, or penetrate the object in anyway. It stressed that the FLIR detects only surface temperature variations by measuring heat emanations from outside the home. It also noted that the defendants did not take measures to contain the emissions within their home. The court based its holding on these facts, and found support for its conclusion in several Supreme Court decisions.

The *Penny-Feeney* court first applied a *Katz* two-prong analysis to determine whether the defendants had an actual expectation of privacy, and if so, whether such an expectation was one that society would consider reasonable. With regard to the first prong of the *Katz* test, the court concluded that the defendants did not manifest an actual expectation of privacy because they voluntarily vented their heat outside their garage. The defendants exposed their heat to the public and did not attempt to prevent its escape or exercise dominion over it.[207]

In its application of the first prong of the *Katz* test, the court did not consider whether the defendants had an actual expectation of privacy regarding the activities within their home. Nor did it consider whether the defendants, by cultivating their crop inside rather than outside, manifested an expectation of privacy. Instead, the court restricted its analysis to whether the defendants demonstrated an actual expectation of privacy in their heat emissions.

Although the court concluded there was no subjective expectation of privacy, it continued its analysis with regard to the second prong of the *Katz* analysis. It found that even if the defendants had demonstrated an actual expectation of privacy, other Supreme Court decisions suggested that such an expectation would be unreasonable to society.[208]

prey against its background." *Id.* Search-image, when used as a behavioral ecology term, is "a predator's pre-conception of what its prey looks like and where it is found." *Id.*

207. *Penny-Feeney*, 773 F. Supp. at 225-26.

208. The court said, "[t]ime and again, the United States Supreme Court has held that police utilization of extra-sensory, non-intrusive equipment . . . to investigate people and objects does not constitute a search for purposes of the Fourth Amendment." *Id.* at 226.

The court compared the FLIR investigation to the investigation of individuals' garbage in *Greenwood*. It characterized the thermal emissions as the incidental byproduct of various indoor energy sources.[209] It analogized the thermal infrared emissions to the garbage in *Greenwood*, calling it "heat waste" or "abandoned heat" that was disposed in an area exposed to the public.[210] The court said that in *Greenwood*, the public exposure was visual and the need to open opaque bags to view the contents did not diminish that fact. Similarly, the district court reasoned, the public exposure in *Penny-Feeney* was heat-sensory, and the need to use a FLIR to detect the emissions did not diminish that fact.[211]

The court continued its analysis by comparing the use of the FLIR to the use of a canine-sniff.[212] The *Penny-Feeney* court found the use of the FLIR, like a canine-sniff, involved no embarrassment to or search of the individuals. The court stated that the target was heat-emanations that, like the odor emanations detected by a canine, was a physical fact, not a protected communication.[213]

Finally, the *Penny-Feeney* court considered the government's use of a helicopter above the defendants' home. Citing *Ciraolo* and *Riley*,[214] it noted that the helicopter was flown in navigable airspace. It continued, "[o]f utmost importance . . . the observation was physically nonintrusive."[215] Operating the FLIR from the helicopter "caused absolutely no physical invasion of the home or curtilage."[216] Instead, the government "did no more than aim a passive infrared instrument at defendants' house from an aerial vantage point for the purpose of detecting disposed heat on the exterior of the house."[217] The court further noted that the officers did not observe intimate de-

209. *Id.*

210. *Id.* at 225-26.

211. *Id.* at 226.

212. The court cited United States v. Solis, 536 F.2d. 880 (9th Cir. 1976). In *Solis*, government drug agents detected the presence of marijuana inside a trailer by using a trained dog, whose sense of smell was eight times as acute as that of humans. The *Solis* court held that the use of a dog to supplement the agent's senses did not constitute a Fourth Amendment search. It noted that the officer's methods were inoffensive, did not cause embarrassment to a person in the trailer, and did not involve a search of the person. *Id.* at 883. It further noted that, unlike *Katz*, the "target was a physical fact indicative of possible crime, not protected communications." *Id.* at 882.

213. *Penny-Feeney*, 773 F. Supp. at 227.

214. *See supra* text accompanying note 110.

215. *Penny-Feeney*, 773 F. Supp. at 228.

216. *Id.*

217. *Id.*

tails connected with the house or curtilage, and did not cause undue noise, wind, dust, or threat of injury.[218]

Although the *Penny-Feeney* court applied the *Katz* test by analogizing the facts to more recent Court decisions, its analysis was reminiscent of *Olmstead*,[219] and contradicted the reasoning of the *Katz* decision. The court considered the FLIR non-intrusive. It stressed that the FLIR is a passive instrument[220] that does not penetrate the object of its investigation. However, the *Katz* majority opinion stipulated that "[t]he fact that [an] electronic device . . . [does] not happen to penetrate the wall . . . can have no constitutional significance."[221] Like *Olmstead*, the district court's pre-*Katz* focus is "bad physics and bad law," since electronic invasions can defeat reasonable expectations of privacy.[222]

Moreover, the court contradicted *Katz* by holding that the defendants had failed to manifest an expectation of privacy by failing to exercise dominion over the escaping heat. In *Katz*, the Court did not ask whether the caller took extraordinary precautions[223] to prevent sound waves from emanating beyond the telephone booth. It was enough that the caller shut the door.[224] Similarly, containing activities within the walls and doors of a house should suffice to show a subjective expectation of privacy.

The district court found it significant that the FLIR inspected a physical fact, in contrast to *Katz*, which regarded a protected communication. This distinction is not supported by *Katz*, and it is doubtful,

218. *Id.* For a comprehensive analysis of *Penny-Feeney*, see Steele, *supra* note 39. The author states that the FLIR can discern what lays behind the solid walls of a dwelling by the amount of heat radiated through those walls. *Id.* at 34. In *Penney-Feeney*, the "state's expert described [the FLIR] as a 'crude instrument in [that] what you obtain from it . . . is an image or a heat distribution pattern of objects in a scene that you're viewing. No way you can identify persons as you would with a video camera, but it . . . can tell you whether there is a person there.'" *Id.* at 34 n.73.

219. *See supra* text accompanying notes 58-59.

220. In remote sensing systems, sensors are either passive or active. Passive devices read natural EMR emissions and reflections, while active devices project energy and read the reflections. *See generally* AVERY & BERLIN, *supra* note 23, at 15.

221. Katz v. United States, 389 U.S. 347, 353 (1967).

222. *See id.* at 362 (Harlan, J., concurring). *Compare* United States v. Domitrovich, where the district court stated, "[T]he fact that information gleaned from surveillance of external phenomena allows law enforcement officials to draw accurate inferences regarding activities occurring inside a structure does not convert the surveillance into a search." United States v. Domitrovich, 852 F. Supp 1460, 1475 (1994).

223. As Wayne LaFave points out, an assertion that extraordinary precautions are necessary cannot be squared with *Katz*. *Katz* did not require the defendant to take any precautionary measures against electronic surveillance. Wayne R. LaFave, *The Fourth Amendment Today: A Bicentennial Appraisal*, 32 VILL. L. REV. 1061, 1080-81 (1987).

224. *See supra* text accompanying notes 65-66.

in light of *Karo*, that even the modern Supreme Court would find the distinction significant. Nothing in *Katz* indicates that protected privacy interests are limited to communications. In *Karo*, the Court rejected the government's argument that there was no Fourth Amendment search when the government used an electric device, while it was located inside a home, to determine *only* whether an object was located within the home. The *Karo* Court reasoned that the electronic device revealed a "critical fact about the interior of the premises that the Government [was] extremely interested in knowing."[225]

Also, although the *Penny-Feeney* court found it significant that the FLIR did not intercept "protected communications," it is not evident, despite the court's words, that an individual would be protected from remote sensing devices capable of intercepting communications. Some courts have held that the government may listen to personal communications made with cordless phones because such communications are easily intercepted, beyond the curtilage, by private third parties.[226]

Nor is it evident that the court would have held differently if it found that the thermal images revealed intimate details connected with the house. The court characterize home infrared radiation as household "waste," comparable to the household garbage in *Greenwood*. In *Greenwood*, the dissent pointed out that household garbage inevitably reveals the most intimate details about the lives of household residents.[227] However, the *Greenwood* majority did not consider the exposure of such intimate details as a factor in its analysis.

Similar to *Greenwood*, the individual in *Penny-Feeney* was compelled to expose household information, contained in "heat waste," outside the home. In *Greenwood*, local governmental ordinances compelled the individual to dispose the garbage outside of the house.[228] In *Penny-Feeney*, it was mother nature that compelled the emission of electromagnetic infrared radiation. Thus, in *United States*

225. United States v. Karo, 468 U.S. 705, 715 (1984); *see also* Washington v. Young, 867 P.2d 593, 602 (1994) ("[L]ike Karo, the information conveyed by the infrared device was critical to the government. The police relied heavily on the infrared surveillance results, and the inferences that could be drawn from them, in obtaining a search warrant.")

226. *See supra* notes text 143-44 and accompanying text.

227. *See supra* note 109.

228. *See supra* note 107 and accompanying text.

v. Deaner,[229] efforts to contain heat within the home did not inhibit the government's effective utilization of the FLIR technology.

In *Deaner*, residents of Mifflin County, Pennsylvania had boarded up some of their home's windows, and covered one window with non-transparent plastic. An agent of the United States Drug Enforcement Agency (DEA), who was conducting a surveillance of the individuals, viewed the window coverings as indicative of an indoor marijuana cultivation operation.[230] With a FLIR-equipped fixed-wing aircraft, DEA agents twice conducted thermal imaging reconnaissance of the properties located in the area.[231] The thermal image of the *Deaner* home was distinct from the images of other homes in the area. It was also consistent with the image captured in another "positive sighting."[232]

The *Deaner* court observed that the individuals made an effort to contain their heat. Thus, in contrast to *Penny-Feeney*, it found no evidence that these individuals had "abandoned their interest in the heat."[233] However, the court determined that the effort to contain the heat was, in itself, evidence that the individuals had no expectation of privacy in their heat. The effort demonstrated the individuals' expectations that heat would escape from the house.[234]

Thus, the *Deaner* court flatly held that "there is no expectation of privacy as to heat emanating from one's home"[235] and found it "abundantly clear that the use of the FLIR was well within the bounds of the Fourth Amendment."[236] Like *Penny-Feeney* it compared the

229. United States v. Deaner, No. CR-92-0090-01, 1992 U.S. Dist. LEXIS 13046 (M.D. Pa. July 27, 1992), *aff'd on other grounds*, 1 F.3d 192 (3rd Cir. 1993).

230. The agent also determined that the individual had purchased 244 pounds of supplies from an indoor-outdoor garden supply company. The agent also identified receipts from the supply company, and remnants of marijuana plants mixed with soil, while searching through the household refuse. *Id.* at *2-4.

231. *Id.* at *4, 7.

232. *Id.* at *4.

233. *Id.* at *8.

234. "[T]here was an expectation that heat would escape from the house, as evidenced by the defendants' efforts to keep the heat inside." *Id.* at *11.

235. *Id.* at *9.

236. *Id.* at *11. The convictions in both *Deaner* and *Penny-Feeney* were affirmed, on other grounds, by the Third Circuit and Ninth Circuit, respectively. United States v. Deaner, 1 F.3d 192 (3rd Cir. 1993); United States v. Feeney, 984 F.2d 1053 (9th Cir. 1993). The appellate courts found it unnecessary to consider whether an FLIR investigation of a home implicates the Fourth Amendment. *Deaner*, 1 F.3d at 197; *Feeney*, 984 F.2d at 1054-55. In both cases, the government had gathered sufficient evidence, through other surveillance methods, to support warrants to search the homes. Thus, even if the FLIR evidence was excluded, the warrants would have been valid and the outcome of each case would have been unchanged. United States v. Karo, 486 U.S. 705, 721 (1984) (holding that unlawfully obtained evidence will not invalidate a warrant where officers have lawfully gathered additional evidence sufficient to establish probable cause.)

FLIR inspection to a canine sniff.[237] It added that DEA aerial-FLIR surveillance is less intrusive than a canine-sniff. It is less embarrassing and offensive because, in contrast, dogs must be accompanied by government agents and must work in close proximity to the target.[238] Also, the FLIR only provides definitive information about heat generation, unlike a canine-sniff which gives a "decisive indication" that contraband is "behind closed doors."[239]

The *Deaner* court said, "The fact that the FLIR is a sophisticated electronic device is irrelevant."[240] It characterized the FLIR as a device that is in general use for commercial purposes, such as the detection of leaks and cracks in buildings, pipes, and high voltage transmission lines.[241] The court observed that many companies market the device, and that it is readily available for purchase or rental, or through the services of a thermographer.[242]

The *Deaner* court recognized that the DEA "utilized the FLIR to confirm . . . [a] belief that Deaner was operating a marijuana grow

The appeals of *Penny-Feeney* and *Deaner* did not settle the FLIR issue. Nonetheless, the homes in those circuits may be, by default, subject to unlimited FLIR surveillance. In future criminal proceedings, there will be no judicial review of FLIR inspections, except where the government fails to gather additional evidence, sufficient to establish probable cause, before seeking a search warrant.

Also, there may be no judicial review if an individual wishes to file a civil suit challenging the constitutionality of an FLIR inspection. A government officer will be held liable for conducting an unlawful search only where pre-existing law made the unlawfulness of the search apparent. Anderson v. Creighton, 483 U.S. 635, 640 (1987).

> The principles of qualified immunity that we reaffirm today require that . . . [the FBI officer] be permitted to argue that he is entitled to summary judgment on the ground that, in light of the clearly established principles governing warrantless searches, he could, as a matter of law, reasonably have believed that the search of the . . . [individual's] home was lawful.

Id. at 641. After these circuit court decisions, the unlawfulness of an FLIR inspection is less than apparent. Thus, unless and until the appellate courts hold otherwise, the government may conduct infrared inspections of homes without any justification and without fear of liability.

237. *Deaner*, 1992 U.S. Dist. LEXIS 13046, at *8-11.

238. *Id.* at *11.

239. *Id.* This analysis is incongruous with the Supreme Court's dicta that regarded canine sniffs as relatively non-intrusive precisely because they definitively revealed only the presence of concealed contraband, and did not expose the presence of noncontraband items.

> [A canine sniff] does not expose noncontraband items that otherwise would remain hidden from public view, as does, for example, an officer's rummaging through the contents of the luggage. Thus, the manner in which information is obtained through this investigative technique is much less intrusive than a typical search. Moreover, the sniff discloses only the presence or absence of narcotics, a contraband item. Thus, despite the fact that the sniff tells the authorities something about the contents of the luggage, the information obtained is limited.

United States v. Place, 462 U.S. 696, 707 (1983).

240. *Deaner*, 1992 U.S. Dist. LEXIS 13046, at *8.

241. *Id.* at *6.

242. *Id.*

room in his house."[243] Yet, the court characterized the FLIR as a device whose "sole function" is to measure surface temperature distinctions, and it concluded that "this information alone tells the DEA nothing of the activity going on inside the structure."[244] The court noted that the evidence submitted at the suppression hearing did not support the defendants' view that the FLIR enables the DEA "essentially to look through walls and roofs to obtain evidence of what is going on inside."[245]

The defendant in the third FLIR case, *United States v. Kyllo*,[246] offered to prove the FLIR's capability to intrude upon the privacies of the home. In *Kyllo*, a special agent of the Bureau of Land Management had enlisted the aid of the Oregon National Guard to create thermal images of an individual's home.[247] The government argued that the FLIR "did not reveal intimate details as to the inside of the home."[248] Instead, it analogized the use of a FLIR, to detect heat emanations and to infer the presence of grow lights, to a visual obser-

243. *Id.* at *7.

244. *Id. But see* United States v. Olson, 21 F.3d 847 (8th Cir. 1994), *cert. denied*, 115 S.Ct. 230 (1994) (the court considered, but did not decide, a motion to suppress evidence from a FLIR inspection); Washington v. Young, 867 P.2d 593 (1994).

> Still photographs of the mobile home were made from the [FLIR] videotape. The photographs revealed rafters on the north side of the mobile home that were visible due to the extreme heat. The agent who reviewed the videotape noted as well that the mobile home appeared to be split into two rooms; the divider wall was visible due to the transfer of heat from the north end of the home into the wall.

Olson, 21 F.3d at 848 n.5.

> With this [thermal detection] device the officer was able to, in effect, "see through the walls" of the home. The device goes well beyond an enhancement of natural senses. In addition, the nighttime infrared surveillance enabled the officers to conduct their surveillance without Mr. Young's knowledge. The infrared device thus represents a particularly intrusive means of observation that exceeds our established surveillance limits.
>
> . . . When directed at a home, the infrared device allows the officer to determine which particular rooms a homeowner is heating, and thus using, at night. This information may reflect a homeowner's financial inability to heat the entire home, the existence and location of energy consuming and heat producing appliances, and possibly even the number of people who may be staying at the residence on a given night. The device discloses information about activities occurring within the confines of the home, and which a person is entitled to keep from disclosure absent a warrant.

Young, 867 P.2d at 598.

245. *Deaner*, 1992 U.S. Dist. LEXIS 13046, at *8 n.1.

246. 809 F. Supp. 787 (D. Or. 1992), *remanded for evidentiary hr'g*, 37 F.3d 526 (9th Cir. 1994).

247. The officers were investigating an indoor marijuana growing operation. The investigation of Kyllo followed from an investigation of another individual, Sam Shook, which was conducted by a task force consisting of several government agencies: The United States Department of Interior, the Bureau of Land Management, the Tillamook County Sheriff's Department, and the Oregon State Police Bureau. *Id.* at 789.

248. *Id.* at 792.

vation of smoke coming from a chimney to infer there was a fire in the fireplace.[249]

The defense sought to show that the FLIR is a sophisticated and sensitive instrument that can determine the types and locations of heat sources within a building, and the presence or absence of insulation.[250] With prolonged use, a trained FLIR operator can detect "sexual activity, the comings and goings of people, or movement from room to room"[251] within the target home. However, the district court limited the scope of the suppression hearing, and would not allow the defendant's expert witness to testify about thermal imaging technology.[252] Without hearing this evidence, the court concluded that "no intimate details of the home[253] were observed; and there was no intrusion upon the privacy of the individuals within the home."[254] Agreeing with *Penny-Feeney*, the *Kyllo* district court held that using a FLIR to detect "surface waste heat"[255] does not constitute a Fourth Amendment search.[256]

The court stated that the Supreme Court has long held that, where there is no warrant, invasion of constitutionally protected homes is presumptively unreasonable.[257] The district court also stated, "The use of sophisticated modern mechanical or electronic devices and the frightening implications of their possible development have led to abandonment of the test of physical trespass within the protected area and a broadening of protection to cover a 'reasonable expectation of privacy.'"[258] However, the court did not clarify what type of "modern mechanical or electronic devices," if not the FLIR,

249. *Id.*

250. Appellant's Opening Brief at 40, United States v. Kyllo, 37 F.3d 526 (9th Cir. 1994) (No. 93-30231).

251. Appellant's Reply Brief at 14, United States v. Kyllo, 37 F.3d 526 (9th Cir. 1994) (No. 93-30231). .

252. Appellant's Opening Brief at 39-40, *Kyllo* (No. 93-30231). The witness was an expert in energy conservation and consumption. *Id.* at 21. The court limited the suppression hearing to a single issue and allowed the expert to testify only with regard to that issue. *See id.* The single issue was whether the government agent had distorted and manipulated power consumption charts from the Portland General Electric Company for the purpose of drawing a false picture to support the search warrant. *Id.* at 6.

253. The *Kyllo* court did not explain what might constitute intimate details of the home.

254. *Kyllo*, 809 F. Supp. at 792.

255. *Id.*

256. *Id.*

257. *Id.* at 791-92.

258. *Id.* at 792 (quoting United States v. Solis, 536 F.2d 880, 886 (9th Cir. 1976).

might provide "sufficiently frightening implications of their possible development" to qualify for Fourth Amendment restrictions.[259]

On appeal, the Ninth Circuit did not decide whether the FLIR inspection in *Kyllo* constituted a Fourth Amendment search.[260] However, it held that the district court had erred by deciding the issue without conducting an evidentiary hearing.[261] The circuit court remanded *Kyllo* to the district court for findings on the technological capabilities of the device.[262] It said, "[O]ur analysis will be affected by whether, on the one extreme, this device can detect sexual activity in the bedroom . . . or, at the other extreme, whether it can only detect hot spots where heat is escaping from a structure."[263]

2. Another Opinion: A Protected Expectation of Privacy

Contrary to the district court holdings in *Penny-Feeney*, *Deaner*, and *Kyllo*, the district court in *United States v. Ishmael*[264] held that the use of thermal imaging technology to investigate a private building constituted a Fourth Amendment search and required a warrant.[265] This holding did not survive its appeal in the Fifth Circuit. Nonetheless, the district court's opinion in *Ishmael* merits attention because it articulates an alternative approach for applying the *Katz* test to FLIR surveillance cases.

259. The defendant in *Kyllo* cited an unpublished state court opinion which considered the implications of developing thermal imaging technology. Appellant's Opening Brief at 45, *Kyllo*, (No. 93-30231) (referring to State v. Binner, No. 92-04-1789 and 1790 (Or. Cir. Ct., Harney Cty. 1993), *rev'd and remanded on other grounds*, 877 P.2d 642 (Or. App. 1994)). The state court held that the warrantless use of a thermal imaging device violated the Oregon and United States Constitutions.

> It is obvious . . . that the use of the thermal imaging equipment was aimed at ascertaining what activities may be occurring within the interior of the house involved. . . . Although one may be impressed with the technological advances involved in the thermal imaging equipment, within a few years the device may appear to be like a stagecoach compared to today's cross-country commercial jets. . . . [H]ow far will Constitutional protections tolerate allowing technological enhanced observations of that which is escaping from a protected place, like one's home, in order to determine what is occurring inside the protected place?

Appellant's Opening Brief at 46, *Kyllo* (No. 93-30231) (quoting *Binner*, No. 92-1789 & 1790). The *Kyllo* district court did not address the question posed by *Binner*.

260. United States v. Kyllo, 37 F.3d 526, 531 (9th Cir. 1994).

261. *Id.*

262. *Id.*

263. *Id.* at 530-31. The circuit court stated that the inquiry regarding reasonable expectations of privacy "cannot be conducted in the abstract." *Id.* at 530. Rather, it requires "some gauge of the intrusiveness of the thermal imaging device, which depends on the quality and the degree of detail of information that it can glean." *Id.* (citing *Dow Chemical*, 476 U.S. 227, 238).

264. 843 F. Supp. 205 (E.D. Tex. 1994) (order granting defendants' motion to suppress), *rev'd*, No. 94-40159, 1995 U.S. App. LEXIS 4957 (5th Cir. Mar. 15, 1995).

265. *Id.* at 213.

The *Ishmael* district court concluded that the government had violated the owners' Fourth Amendment rights because it used the technology without first obtaining a warrant. The court said:

> The issue was spawned by the tension created between the right to privacy on the one hand and our society's rapidly evolving technological sophistication on the other. . . . We must take care that the war on drugs not count as one of its victims fundamental rights. The benefits to our society of safeguarding the right to privacy is such that the courts must say that there is a limit to the use of technological weapons, even in the war on drugs.[266]

In *Ishmael*, the DEA had begun a year-long surveillance of an individual upon receiving information that the individual was mixing concrete remix for a construction project on his secluded wooded property.[267] Law enforcement officers entered the property to conduct surveillance but found no illegal activity.[268] One year later, the DEA resumed the surveillance and determined that the individual had constructed a metal building on his property and used the concrete to build a basement under the building.[269]

Officers used a FLIR-equipped helicopter to tape thermal images of the metal building from approximately 1000-1500 feet, and they entered the property to use a handheld thermal imager. The images revealed that the building and a nearby brush pile were considerably hotter than the surrounding land. The officers also conducted a series of visual aerial and ground-based observations, and analyzed records of the individual's criminal history, phone calls, purchases, and electrical usage.[270] A search warrant was then obtained, and a physical search of the building revealed a marijuana-growing operation.

266. *Id.* at 207-08.

267. *Id.* at 208. The informant had delivered large quantities of the remix to the individual who paid in cash. The informant observed that the individual appeared nervous or suspicious, and did not want to be accompanied to the construction site. *Id.*

268. *Id.* The officers found two mobile homes, large plastic tanks, and a trailer containing pipe. *Id.*

269. *Id.*

270. *Id.* The individual's criminal history included possession, distribution, and growing of marijuana.

In 1991, the individual purchased the 130 acre tract of land. During 1991-1993, the individual made extensive purchases of construction equipment and supplies, electrical supplies, and farm and garden supplies. Electrical records showed an increased usage of electricity during 1993 in both the mobile home and the metal building. Visual observations showed that the metal building had a exhaust fan that was continuously running, and that pressurized water flowed from the building to a nearby pond. *Id.*

The individual had an equipment rental business which did not have a local telephone listing. During seven different day and nighttime trespasses upon the property, officers did not observe any signs of vehicle traffic or people around the building. The officers concluded the building was not the site of a legitimate business operation. *Id.* at 209.

The *Ishmael* district court applied the *Katz* two-prong test. Regarding the first prong, it concluded that the individual had demonstrated a subjective expectation of privacy when he located the building in a secluded area and personally constructed the basement so that others would not know about its existence.[271]

Regarding the second prong, the court noted that the "test of legitimacy is not whether the individual chooses to conceal his activity, but instead 'whether the government's intrusion infringes upon the personal and societal values protected by the Fourth Amendment.'"[272] The court found that the individual's expectation of privacy was reasonable because the property was a business premises that was not open to the public,[273] and the thermal images allowed the officers to observe what was not visible to the naked eye.[274]

The court noted that the Fourth Amendment does not protect individuals against surveillance of property that is plainly visible from the air or ground.[275] However, the court rejected the government's argument that the heat emissions were in plain view. It also did not agree that the warrantless use of thermal imaging devices was consistent with the holding in *Dow Chemical.*

Instead, the court pointed to *Dow Chemical's* warning that the surveillance of private property using highly sophisticated technology might be constitutionally proscribed absent a warrant.[276] The thermal imaging technology detected and recorded an image of something that was not plainly viewable.[277] Thus, the court found that thermal imag-

Based on this information and the thermal images, a DEA agent swore out an affidavit for a warrant to physically search the property. *Id.*

271. *Id.*

272. *Id.* (citing Oliver v. United States, 466 U.S. 170, 181-83 (1984)).

273. *Id.* at 212. The court found that the building should be characterized as a business premise; therefore it was subject to the same Fourth Amendment protection as a house. Evidence showed that the business was duly registered with the State of Texas, and that the premises was not open to the public. The court rejected the government's assertions that the building was not used for a legitimate business, and that the "open fields" doctrine should apply because the building was located outside the curtilage of defendants' home. *Id.* at 209-11. The court noted that there is "no authority for, and no logic in, creating an exception to the warrant requirement because law enforcement officials believe that a particular business is engaged in illegal activity." *Id.* at 211.

274. *Id.* at 212.

275. In support, the court reviewed the facts and holdings in *Ciraolo* and *Riley*. *Id.* at 211. The court also noted that although the officers trespassed upon the property, this has "little or no relevance to the application of the Fourth Amendment." *Id.* at 210 (citing *Oliver*, 466 U.S. at 184).

276. *Id.* at 212. *See supra* text accompanying note 134.

277. *Ishmael*, 843 F. Supp. at 212; *see also*, *Field*, 1994 U.S. Dist. LEXIS 8829.

> Whether a device is passive is irrelevant; what is relevant is what the device records. . . . [T]he imager records the heat escaping from the walls that is emitted by an object on

ing devices were "exactly the type of sophisticated technology that concerned the Supreme Court"[278] in *Dow Chemical.*

The *Ishmael* district court also disagreed with *Penny-Feeney's* analogy comparing heat emissions to abandoned garbage.[279] It stated that the waste heat analogy might have validity only if the law enforcement agent had detected the heat without a sense-enhancing device.[280] The court said, "If the government has the right to repeatedly trespass, conduct visual searches . . . , and make frequent flyovers using FLIR and other advanced technology, all without a warrant, there is precious little left of the right to privacy."[281]

Finally, the *Ishmael* district court disagreed that a FLIR inspection is comparable to a canine sniff. The FLIR is more intrusive because the thermal imager cannot distinguish between "contraband heat" and "legal heat."[282] Also, although a dog's sense of smell may supplement a human's senses, it "does not compare to a technology that can turn minute gradations in temperature into video tapes from 1500 feet away."[283]

The court found that absent the FLIR images there was insufficient evidence of illegal activity to support the warrant to search the building.[284] "The evidence of their activity was consistent with developing a new patented strain of African Violets, and innumerable other perfectly legal activities."[285] Thus, the court granted the defendants' motion to suppress all evidence seized during the physical search.[286]

On appeal, the Fifth Circuit agreed that the defendant in *Ishmael* had satisfied the first-prong of the *Katz* test. The defendants had clearly exhibited a subjective expectation of privacy, "[t]hough the Ishmaels did not—indeed, could not—take every precaution against the detection of the hydroponic laboratory."[287] However, the appel-

> the other side of the wall. To the extent the device can pick up such radiation and record it, it can "see through" walls.

Id. at *2.

278. *Ishmael*, 843 F. Supp. at 212.

279. *Id.* at 213.

280. *Id.*

281. *Id.*

282. *Id.*; *accord Field*, 1994 U.S. Dist. LEXIS 8829, at *3-4.

283. *Ishmael*, 843 F. Supp. at 213. This reasoning is reminiscent of Justice Douglas' dissent in *White* where he argued that to equate electronic surveillance with unaided eavesdropping is like equating the first gun powder with the nuclear bomb. *See supra* note 86.

284. *Ishmael*, 843 F. Supp. at 214.

285. *Id.*

286. *Id.*

287. United States v. Ishmael, No. 94-40159, 1995 U.S. App. LEXIS 4957, at *15 (5th Cir. Mar. 15, 1995).

late court concluded that the defendants' privacy expectations were objectively unreasonable. Like the *Penny-Feeney* line of cases, the Fifth Circuit found it significant that the FLIR was a passive device which was commercially available and did not reveal "intimate details" about the interior of the structure.[288] The appellate court also found that the defendants' building stood in an "open field."[289] The court concluded that "[t]he device, when used in an 'open field,' does not offend the Fourth Amendment."[290]

3. Protecting People, Not Heat

The opinions in the federal cases are striking in their diverse approaches to *Katz*'s test for reasonable expectations of privacy. Unlike the others, the district court's opinion in *Ishmael* bears a marked resemblance to the original *Katz* analysis. The *Ishmael* district court centered its analysis on the privacy expectations associated with an individual's personal and business activities. This court concluded that the individual had reasonable privacy expectations because the individual took reasonable precautions to conceal the activities from public observation. It further concluded that using the advanced thermal imaging technology to defeat those expectations was prohibitively intrusive without a warrant.

In contrast, the *Penny-Feeney*, *Deaner*, and *Kyllo* courts did not consider whether the individuals had manifested reasonable expectations of privacy regarding their activities, even though they confined these activities behind the walls and closed doors of their homes. Instead, these courts concentrated their analyses on whether people have reasonable privacy expectations regarding escaping thermal infrared radiation.

With regard to the subjective prong of the *Katz* test, *Penny-Feeney* and *Deaner* reached the same result based on diametrically opposed reasons. In *Penny-Feeney*, the government successfully argued that the individuals failed to exhibit expectations of privacy by failing to take precautionary steps to conceal their heat. However, the *Deaner* court found that individuals who had taken such precautionary steps thereby proved they had no expectations that their heat emissions were private.

288. *Id.* at *20-21.
289. *Id.* at *22-23.
290. *Id.* at *25.

Thus, *Deaner* creates a complete catch-22 for anyone who would seek to keep private information that can be detected by a FLIR. After citing *Penny-Feeney* for the proposition that failing to take precautions defeats *Katz's* subjective expectation test, the *Deaner* court concluded that taking such precautionary efforts also defeats the same test.[291] By focusing their analyses on the emissions, rather than the privacy of the people whose activities generated the emissions, these three court opinions bear no resemblance to *Katz*.[292]

It is disturbing that *Penny-Feeney* and its progeny considered the FLIR non-intrusive because it operated passively from a distance. This illustrates the kind of reasoning that *Katz* criticized as "bad physics and bad law." The term "passive" may be easily misunderstood as meaning weak or ineffectual. Instead, being passive, rather than active, means only that the technology operates by sensing emissions rather than inducing reflections. The *Kyllo* district court's conclusion was particularly disturbing since it refused to entertain the evidence which was offered to prove the intrusive capabilities of this passive instrument. It is encouraging that the Ninth Circuit remanded *Kyllo* so that the evidence could be heard.

The courts should have found that passive surveillance may be more intrusive than a traditional physical search. The subject of undetectable monitoring never knows if, or what, information is being retrieved and recorded.[293] Thus, one officer recently commented, "The beauty of thermal imaging is its passivity. We receive information, but give no indication to the suspect that we are on to him."[294] If the analyses of these courts were extended to their logical conclusion, the courts could find that some of the most sophisticated satellite remote sensing systems provide the least intrusive means of citizen surveillance.

It is inescapable that the sole purpose behind these FLIR inspections was to defeat expectations of privacy in concealed, indoor activi-

291. Thus, by manifesting a subjective intention to protect privacy, the individuals proved they had no subjective expectation of privacy at all. Ironically, through their own efforts to protect their privacy interests, the individuals defeated these interests in two ways. First, their precautions alerted the government to their desire to protect their home activities from observation; and it provided evidence to infer possible criminal activity. *See supra* text accompanying note 225. Second, their precautions convinced the trial court to conclude that they had no expectation of privacy in the emissions they tried to contain.

292. *See supra* note 218.

293. *See supra* notes 181, 183-84 and accompanying text.

294. Gareth Huw Davies, *Thermal Imager Aids Police in Hot Pursuit*, SUNDAY TIMES, Sept. 12, 1993, (Business), at 9 (quoting an English officer who is a member of a police air-support unit).

ties.[295] Such purposeful intrusions should not be masked behind analyses that compare and contrast the privacy expectations in waste, sound waves, odors, and electromagnetic radiation. Such analyses recognize only that we are biological creatures inevitably governed by the laws of physics. They ignore the more relevant truth that we are also autonomous individuals living in a nation governed by constitutional laws.

B. Protecting People in the State of Washington

In *Washington v. Young*,[296] the Washington Supreme Court rendered a remarkable opinion which analyzed the government's use of thermal infrared detection technology to investigate homes. The court found that the technology "represents a particularly intrusive means of surveillance," which, in the absence of a warrant, violated its state constitutional protection of the people's private affairs and homes,[297] and violated the Fourth Amendment.[298] Late at night, positioned on the street, government officers had used a thermal infrared detection device "to, in effect, 'see through the walls' of the home"[299] without the resident's knowledge. The court found it "especially troubling"[300] and "constitutionally offensive"[301] that, as part of the investigation, the officers analyzed and compared the thermal infrared patterns emitted by other homes in the neighborhood which were not suspected of housing criminal activity.

> If we were to hold the use of the device does not constitute a search, no limitation would be placed on the government's ability to use the device on any private residence, on any particular night, even if no criminal activity is suspected. Such police activity is constitutionally offensive.
>
> Such unrestricted, sense-enhanced observations present a dangerous amount of police discretion. This kind of surveillance avoids the protection of a warrant issued upon probable cause by a neutral magistrate. Not only does this practice eviscerate the traditional requirement that police identify a particular suspect prior to initiating a search, but it also facilitates clandestine investigations by the police force, which are not subject to the traditional restraint of public accountability. Such secret surveillance may not only chill free ex-

295. *See* Washington v. Young, 867 P.2d 593, 603 (Wash. 1994).
296. *Id.* at 593.
297. *Id.* at 601.
298. *Id.*
299. *Id.* at 598; *see supra* note 239.
300. *Young*, 867 P.2d at 600.
301. *Id.*

pression, but also may encourage arbitrary and inappropriate police conduct.[302]

Although the state court based its decision upon the state's constitution, it also compared and contrasted the case with modern Fourth Amendment cases "for the purpose of providing guidance to other courts on the subject of sense-enhanced surveillance of a home."[303] The court stressed that people have a reasonable expectation of privacy in their homes. It found that a thermal infrared inspection of a home was at least as intrusive as the beeper technology used to illegally search a home in *Karo*.[304]

The court rejected *Penny-Feeney's* analysis. It found the "heat waste" analogy unconvincing; unlike the disposal of household garbage, home residents cannot avoid the risks associated with thermal infrared emissions, except by refraining from home activities and turning off home energy sources.[305] The court also rejected the canine sniff analysis. It cited a Second Circuit case, *United States v. Thomas*,[306] which held that a warrantless canine sniff of a home violated the Fourth Amendment, because an individual has a heightened expectation of privacy in the home and the canine sniff involved superior sensing capabilities to intrude upon that privacy.

In interpreting its own state constitution, the Washington court's analysis was reminiscent of Justice Harlan's dissent in *White*.[307] Unlike the modern Fourth Amendment threshold analysis, Washington's inquiry is "'not confined to the subjective privacy expectations of modern citizens who, due to well publicized advances in surveillance technology, are learning to expect diminished privacy in many aspects of their lives.'"[308] Instead, "[w]e believe our legal right to privacy should reflect thoughtful and purposeful choices rather than simply mirror the current state of the commercial technology industry."[309] Thus, the inquiry must focus on "'those privacy interests which citizens of this state have held, and should be entitled to hold, safe from governmental trespass absent a warrant.'"[310]

302. *Id.* (citing Steinberg, *supra* note 121, at 569).
303. *Id.* at 601.
304. *Id.* at 602; *see supra* note 225.
305. *Young*, 867 P.2d at 602-03.
306. *Id.* at 603-04 (citing United States v. Thomas, 757 F.2d 1359 (2d Cir. 1985), *certs. denied*, 474 U.S. 819 (1985), 479 U.S. 818 (1986)).
307. *See supra* text accompanying notes 83-85.
308. *Young*, 867 P.2d at 597 (quoting State v. Myrick, 688 P.2d 151 (Wash. 1984)).
309. *Id.* at 598.
310. *Id.* at 597 (quoting *Myrick*, 688 P.2d at 154).

CONCLUSION

Surely, our courts fail to adjudicate constitutional claims when constitutional law is rendered impotent against the physical laws exploited by military techniques and technologies. These courts are equating "reasonable expectations of privacy" with cynical apprehensions of what privacies, as a practical matter, can be absolutely guaranteed in our universe. This defeats the essential purpose of the Bill of Rights. These constitutional laws work to extend protections to the people which, as a practical matter, cannot otherwise be guaranteed.

The Fourth Amendment constitutes our nation's principle restraint on unreasonable government intrusions into the private lives of Americans. It codifies a five-hundred year-old tradition of immunizing the sanctity of the home and the privacies of life from the arbitrary "prying eyes of the government."[311] However, in our technologically advancing society, we are losing all meaningful restraints on arbitrary government surveillance, as modern methods are held beyond the Fourth Amendment threshold.

To recognize Fourth Amendment protection against unreasonable remote sensing intrusions, the Supreme Court need not strain the language of the Amendment. On the contrary, it need only apply common understandings of the term "search." Nor would the Court have to stray from traditional interpretations of the Amendment. The Court can find strong foundation in the landmark holdings of *Boyd* and *Katz*.

311. *See supra* text accompanying note 45.